RAILROAD GAZETTE

FRIDAY, OCTOBER 6.

Contributions.

Protecting the Rear of Delayed Trains.

TO THE EDITOR OF THE RAILROAD GAZETTE:

That there is very great difficulty in enforcing the order that brakemen shall always go out and protect the rear of delayed trains has recently been pointed out in the pages of the *Railroad Gazette*. Probably railroad superintendents appreciate the difficulty quite as fully as any one else, but the trouble is to know how to remedy the matter. One of the obstacles in the way of enforcing the order is that it is usually impossible for a superintendent to know, excepting in case of accident, whether the order is obeyed. What is needed is some kind of a check on the men, by which it can be known, in case a train is delayed, whether or not a brakeman went back the prescribed distance. With this object in view it is proposed that all the telegraph poles along the line of a road be numbered. Then require the conductors of all trains which are delayed to report the number of the telegraph pole at which the delay occurred, and require the rear brakeman to go back a distance of say ten poles and chalk, or otherwise mark, the tenth one from the delayed train. When the conductor's report comes in, telegraph to the trackmen of the section on which the delay occurred, and require them to report whether or not the brakeman's mark can be found on the tenth pole back, or thereabouts, and if found have them report and erase the mark. If no such mark was made, it will show that the rear of the train was not properly protected. Such a system would supply the superintendent with a constant record showing whether this important rule is obeyed or not. The expense of numbering the telegraph poles on a road would be very trifling, and probably some better means than chalking the post could be devised for recording the faithfulness of the brakeman. A nail or hook might be driven into each pole, to which he would attach a check with his number on it. This could be removed by the trackmen, and the number of the pole on which it was found be marked on the back and returned to the superintendent's office. The two numbers on it would indicate who the man was and on which post it was found.

Wasting and Saving Coal with Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The coal bill of the locomotive department constitutes an expensive item in railroad expenditures; it makes a heavy drain upon the income of every railroad in the country. That the present system of burning coal for generation of steam is extremely wasteful of calorific effect there can be no question; but the problem of effecting any material saving is very difficult to solve.

The ordinary run of bituminous coal used for locomotive fuel contains ingredients capable of evaporating from twelve to fourteen times its own weight of water when thoroughly utilized. In common locomotive practice, the evaporation of six or seven pounds of water to the pound of coal is an extraordinarily high attainment, and there is good reason to believe that the average evaporative duty of American locomotives does not reach five pounds of water to the pound of coal consumed. Certain forms of steam boilers, which are not subjected to the excessive forced draft inseparable from locomotives, daily generate nine or ten pounds of water per pound of coal. There are locomotives running in Europe which often approach an evaporative duty of ten pounds. On the London & Northwestern Railroad in England, express engines making an average speed of 45 miles an hour, and pulling a train equal to six American coaches, burn from 23 to 20 lbs. of coal per mile. Other first-class British railways show similar performances. The chemical properties of the coal used on English roads are substantially the same as the ordinary run of bituminous coal burned this side of the Atlantic. We have very few engines that will perform the same work without burning 40 lbs. per mile. These facts should furnish a wholesome subject of reflection to American engineers, since they indicate possibilities of economical operation which have been overlooked or neglected among us.

Some cause for the difference in the economical results between American and British railway practice may probably be discovered in the conditions under which coal burning was commenced in the two countries.

Bituminous coal is the natural fuel of Great Britain. When railway operating first commenced there, the new form of transportation was regarded as an innovation that deserved no encouragement. Popular sentiment was disposed to throw every obstacle in the way of railway development, and a prominent bugbear of the opposition was that locomotives would pollute the air with their smoke. In consequence of this feeling, smoking locomotives were strictly forbidden by law, and heavy penalties were hung like the sword of Damocles over the heads of railway managers who did not rigidly enforce the arbitrary smoke ordinances of these times. As the art of smoke-consuming had not made any progress then, locomotives, during the first decade after the opening of the Liverpool & Manchester Railway, had to burn coal deprived of its volatile or smoke-producing substances. This coke did very well for steam-making, but it proved an expensive form of fuel; and when the question of economy arose, as it always does arise, the minds of mechanical men and of scientists turned to investigating the possibility of burning coal in locomotives without violating the law. Numerous forms of smoke-consuming fire-boxes were invented and patented, with ostentatious claims of perfection. Some of the devices were good and many of them were worthless. In practice, it was found that the best smoke-consuming fire-box amounted to nothing when left to operate without intelligent supervision. The statutory enactments against the smoke nuisance were so savagely enforced that there was no danger of engine-drivers and firemen lapsing into carelessness. The emission of black smoke in a town or about a station was almost certain to entail a rebuke—often of the sharpest kind. So firing was done with regard to keeping out of trouble. As success in smoke-consuming consisted principally in careful and skillful firing, careful firing became the rule and produced economy of heat as a direct result.

When an engine stopped at a station and began to emit smoke, the fireman would close the dampers, open the fire-box door and start the blower a little. If the fire had fresh coal on top, the smoke would not be so easily vanquished, but a good fireman would quickly manage it by holding his shovel in the fire-door, slanting toward the fire for a few seconds, by which means a current of air would be deflected upon the surface of the fire. From this practice of deflecting air with the shovel originated the baffle plate, which was fastened inside the fire-box and performed the functions of air-deflecting very satisfactorily. It was found, by practicing the smoke-consuming methods of firing, that the quantity of air admitted to the fire, and the way it was admitted, had an important effect upon the success of smoke-consumption. It was found necessary that engine-men should have the means of regulating the admission of air above and below the fire with some degree of accuracy. So close ash-pans and dampers that fitted the openings were provided; then came the various methods of supplying air above the fire, which were generally capable of being regulated so that the supply did not exceed the needs. This means of restraining the supply of heat just to meet the demands of steam-making was a long stride in the way of fuel-saving. Watching and manipulating these smoke-consuming appliances was an excellent training for enginemen, because it familiarized their minds with what were really the inner principles of fuel combustion. They learned the science of their business, which tended to show how the smallest quantity of coal could be made to produce the greatest head of steam. They discovered that on the road, by careful firing, smoke-consuming could be practiced, even with plain fire-boxes of the common oblong pattern. This was done by keeping a bright fire on the front part of the grates. Before introducing fresh coal the fireman always pushed the partly-consumed or coked coal to the front of the grates, and the fresh coal was scattered behind it. The volatile gases from the fresh coal in going off towards the tubes had the smoke burned by passing over the incandescent mass in front.

The consumption of coke in locomotive fire-boxes was performed under conditions similar to the burning of anthracite coal. Very few sparks were thrown by the action of the blast, and no necessity called for equipping the engines with spark arresters. When soft coal began to come into use as locomotive fuel, there was more spark throwing, but spark arresters were practically unknown, and no demand was made for inventing or adopting such a device. By using an open stack, locomotive superintendents in Britain were able to make engines steam with comparatively wide blast orifices; for no intensity of blast was needed to overcome the obstruction to draft caused by cones and netting. British locomotives obtain several advantages over their transatlantic compeers through the use of wide nozzles. They do not throw any more sparks than what are hourly propelled through the draft-smothering arrangements legally known as "the most approved appliances for preventing spark throwing." They obtain better use of the steam, owing to the relief from back pressure on the pistons. Steam is kept up with a lower smoke-box temperature, and the speed of the gases of combustion over the heating surfaces is not so rapid as where a more intensified blast is used; the practical result being that more of the heat is abstracted from the gases.

Recognizing the importance of economy in coal consumption, British railway managers, as a rule, encourage enginemen in fuel-saving by granting premiums as an incentive to economy. The usual manner of apportionment is to allow engines of the same class and size a certain quantity of fuel per car mile. If the full allowance is not used, the surplus is credited to the engine-men, and they are allowed a money percentage on the saving of coal. Nothing is more difficult than to decide with certainty the proportion of coal saving which is due to the skill and management of enginemen. So many circumstances intervene to vary the quantity of coal required that the men who work the hardest and operate most skilfully for saving often fail to obtain due credit. Consequently the system of premiums causes much dissatisfaction and jealousy among engine-men, but the effect of the system in lessening the aggregate consumption of coal is very decided.

To the superior methods of fire management developed by strict smoke-forbidding ordinances, to the wide nozzles rendered practicable with a clear smoke-stack, and to the emulation in coal-saving engendered by the premium system, may be traced the cause of the economical results reached in British locomotive practice.

When the change was made from wood to bituminous coal burning in America, the first thing considered was the means of making sufficient steam. All the stack obstructions necessary with wood-burning were retained for coal, modified to suit the new fuel. Coal was generally so cheap that little attention was paid to economy in its consumption; and engine-men became educated to regard fuel-wasting with indifference. Now that the importance of coal-saving is becoming properly realized, and railroad managers are urging the necessity for better results, it is hard to school engineers and firemen to appreciate the subject with all its weighty import. Nor is preaching lessons of economy likely to produce any effectual reform, while engine-makers continue to violate the principles whereon fuel-saving is based. Many locomotive builders exhibit supreme carelessness about supplying means of regulating the draft. Ash-pans are often made so imperfectly that they will scarcely hold in cinders, and to call the doors of ash-pans dampers is a delusion and a snare. The absence of fit about the doors is so conspicuous that the idea of shutting them to curtail admission of air is seldom entertained. All over the United States engines can be seen daily standing at stations blowing off steam, and to have the dampers closed is the exception rather than the rule. The waste entailed by this practice is almost entirely due to the loose way ash-pans and dampers are put together, and to the inferior arrangement of rods and handles for operating dampers. The damper handles of British engines can generally be operated as easily and as accurately as the reverse lever, and shutting those dampers means checking the draft; consequently they are used with good effect on the road and at stations.

Locomotives have been constructed here with the special design of consuming their smoke, and proving easier on fuel than those with the plain fire-box. Much disappointment has been experienced by the performance of such engines, for they were generally found to be no improvement whatever, so far as the fuel bill was concerned. Too much was expected of the machine, and too little consideration was bestowed upon the man who ran it. The true beginning of economy in fuel-saving lies in training the men who run the engines and in giving them the proper appliances to work with.

The great transportation problem which is under solution in this country, the question how cheaply produce can be moved to the point of consumption, will surely, however slowly, compel reform in heat-using methods. The survival of the fittest applies to railroad communities as well as to the animal and commercial worlds. The railroad manager who succeeds in reducing his coal bill 10 per cent., everything else being equal, is going to beat his rivals in the race of competition.

ANGUS SINCLAIR.

Papers on Painting.—No. 22.

BY CHARLES L. CONDIT.

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PAINTING IRON—NO. 2.

White Lead.—White lead is so much used for painting iron that we should be able to give some definite experience in regard to it; yet we cannot. It is supposed by many painters to rust iron, and yet one of the most observing painters that we know is of the opinion that (judging from experience) the chances are even that the greater appearance of rust under white lead on iron is due to the fact of the greater contrast between the rust color and the white lead.

Theoretically, of course, as white lead contains carbonic acid, it is able to rust iron rapidly, on the supposition that the carbonic acid separates itself from the lead. This it is supposed to do when, on painting a black surface with white lead, the black surface after a time shows through the lead color much more plainly than at first.

All that can be said, so far as any facts are concerned, is that white lead should not, if possible, be used in priming iron, nor in any priming coat. Moreover, it is a less desirable over-coat than iron oxide. It probably, however, equals zinc in durability, and exceeds it wherever, as on railroad bridges for example, the paint is exposed to acid gases. Zinc is very quickly affected by acids, as is also the white lead as a compound of carbonic acid, the carbonic being driven off and the whiteness of the paint as well. Nevertheless, I am inclined to believe that so far as durability and not appearance is concerned, the lead will outlast the zinc when both are exposed to acid gases, including the carbonic acid of the open air. I can, however, give no certain proof.

Pure white lead and pure zinc are here referred to, while as a protective coat for iron neither should be used pure. The powdering of white lead has already been discussed, and the experimental evidence as to its cause gets the strongest practical proof from out-door use of white paint. Nearly anything mixed with white lead will greatly improve its durability. Even a very minute percentage of Indian red and lamp black shows its effect plainly when we compare the durability of the pure white paint on the clapboard and the mixed paint on the moldings of a house. The one will generally be found after a couple of years (according to the exposure to the sun) to be in the condition of a whitewash, while the other and hotter color will powder off but little.

Unmixed white lead should never be used as outside protection, unless its color is very much desired.

Something should be mixed with the lead to prevent the effect produced by the carbonic acid lead on the oil. The oil is emulsified (separated) in some way, probably into finer drops, and the mixture of almost everything with the white lead tends, apparently, to over-

come this effect, whatever its cause.* White lead is not a whitewash, only because it contains a little water-lead (oxy-hydrate) which chemically unites with the oil. It is probable, therefore, that by increasing the amount of soap (water-lead acts by forming a soap) we still further improve the lead, although necessarily by loss of its purity of color. If a white color is a necessity, a mixture of zinc white and white lead is to be recommended, but it will be well to use a little drier with the paint. If purity of color is essential, care must be taken that the zinc contains no sulphuric acid, as this will attack the lead; zinc from ores containing sulphur combinations contains small quantities of sulphuric acid.

If a pure white is not a necessity, it is doubtful (merely) whether any combination of zinc with lead in the same coat is not a mistake. Better is it, then, to use the ochres. The standard paint for bridges on the Pennsylvania Railroad is white lead and a little yellow ochre, overheads being coated with asphaltum on account of the color and greater durability under the effects of the smoke.

Almost anything will improve the carbonic acid lead. Even the lower grades of white lead, which as we have shown, contain a good deal of barytes, zinc and lime, are thought by some to stand quite as well as pure lead. It is hardly necessary to say, however, that no such combination is to be recommended† except to illustrate the fact that almost anything with pure white lead is an advantage, wherever the paint is to be exposed to *the sun*. "The weather" alone has no very injurious effect on the lead unless the sun gets at the paint, but after the sun has shone for some months the rain and storm can beat off the lead as though it were only lime. It shows the need of thorough investigation of these questions that this effect has been accepted by painters of considerable chemical knowledge as the result of the chemical combination of the lead with the oil, while it is only because of this combination by less than one-fourth of the lead that the paint holds at all.‡

Iron Paints.—These are of two classes and many kinds. In the first class are the artificial iron paints, which are commonly made from copperas and from refuse iron from the manufactories of sulphuric acid, dyes, etc. These contain more or less sulphuric acid and are never to be used on iron as a first coat, nor as a second coat if it can be avoided. They are of higher price and in a variety of colors, and only as colors would there be any temptation to use them.

The second class of iron colors consists of ores of natural iron rust combined with clay or with some forms of silica. Their value for iron depends upon the fact that they contain no water and no sulphuric acid. If there is water in these rusts (paints)§ they will act upon the iron as common rust. Moreover, this dry and roasted rust (paint) does not act as a protection to the iron, but to the oil. So far as protection to iron is concerned, no paint contains any other protective power than that given it by the oil, and only by hardening the oil and protecting it from the action of the air when it has once become sufficiently hardened that any paint has any influence on iron. It is necessary to lay down this prime principle in the strongest way, in order that we may choose our paint with a clear mind, not befogged with notions about affinities or "anti-corrosion paints." An anti-corrosive paint would be a paint of zinc, for instance, which should have such an attraction for oxygen as to cause the oxygen to attack and *destroy*‖ it in place of the iron. An "antacid" paint might be used, since iron without the aid of acid hardly rusts at all; but since the amount of carbonic acid in the air is unlimited, we should require an unlimited amount of base substance to neutralize the paint; and if the surface of the base substance were not in some way constantly renewed, one paint would soon act as it does usually, to wit, as a mere water-proofer for the iron.

At present all paints protect iron by inclosing it in a water-proof layer, continuous and impenetrable. The only question involved in painting iron is the durability of this impenetrability.

1st. The sun injures the layer in two ways. If, says Prof. Max Pettenkofer, the not-drying oil acids are removed from freshly dried linseed oil by ether and etherial oils, an elastic caoutchouc-like substance remains, which by degrees is hardened and made brittle by the air, and in this condition easily separates into parts, or, in simple language, cracks open.

Says G. J. Mulder, there are two periods in the drying of linseed oil, the first of which only I have studied. The first period occurs in the early months, and leaves the not-drying part of the oil (20 per cent.) unchanged, only the glycerine-ether being driven off and oil-leather (linoxyn) produced. So long as this period lasts is the covering always dry, but remains elastic. When the second period is entered upon, it becomes brittle. The first period lasts a longer time in lower temperature and out of the direct rays of the sun. Under these conditions the oil in drying always increases more in weight. In ordinary temperatures and in diffused light 100 parts of linseed oil become 111 to 112 parts, but warmed to 170, 4 to 5 parts are lost. In the direct sunlight 100 parts of the oil gain less than 7 parts; oil dried in the sun and partly covered by the sun gained respectively 5 per cent. and 10 per cent., or a difference of 5 per cent.

Or, in other words, a difference of about one quart of oil in 1,000 ft. of surface. This quart of oil is not-drying oil, which has been changed by the sun's rays into a flying-oil acid during the first three months. Now, supposing the rate* of loss to continue for 12 months, the oil on the 1,000 ft. of surface (20 quarts) would have lost about all of its not-drying acids (4 quarts).

Oil drying on the inside of the house would at the same time have lost almost no substance. By actual examination Mulder found that oil in the house contained after four months drying its full amount (20 per cent.) of not-dry acids, combined with 91 per cent. of tough oil-leather.

Here then are the simple conditions under which we must work in preserving iron by oil: We must prevent the drying part of the oil from becoming hard-dry; we must keep the soft-keeping not-drying acids from flying away in so great quantity as to reduce the oil to a brittle mass. To attempt these things is to work on a basis of intelligent facts. Putting aside all ideas of "affinity"† between this and that paint and iron, the only intelligent questions we need ask about protection by any paint substance are, does it contain any hurtful acid; will it protect the elastic qualities of the oil (the drying and the not-drying acids from the action of oxygen); how long will it do this, and what is its price.

Particles of paint protect oil in three ways:

1st. They cover the oil and by their own substance thus protect the oil drops from the sun, the air, and the storms of rain, sleet and dust.

For this purpose we must, of course, have substances which are not themselves affected by the sun and the atmosphere. Iron, lead, silicon and slate are not much affected, zinc more than other substances when acid is present in the air. Sanding the surface of paint is merely applying the protecting power of silex particles to the surface of the oil and it furnishes a cheap and efficacious method.‡ In general, however, painters have preferred to mix the protecting substance with the paint.

The protection of such mixed substance is however, greater, if the paint particles are very fine, and it is more perfect the more perfectly the particles are combined uniformly with the particles of oil.

For these reasons iron oxide paints should first be ground very fine, and then thoroughly ground for hours with the oil.

Care should also be taken that they contain no acid (as many iron ores do), and that the water has been thoroughly roasted out of them.

2d. There is a chemical combination between the oil and paint as soap, which is protective. Lead certainly (except carbonic acid lead), and probably iron and zinc, unite with the oil, and hold fast the flying acids. It is very difficult to bring proof on every point, but it is probable that where no portion of the protecting substance unites with the oil, there is greater tendency of the paint to crumble. At least it is true that all substances used as pure paints have some soap-making powers, and wherever hardness is required soap must be had, or the hardness will be the over-drying of the oil, or the first step in decay.

The hardest soap is given by lead, especially red lead, and (3d) this hardness is a protection by itself. When a freshly painted car or carriage is placed in the sun it is injured, while the same vehicle may be freely exposed after two or three weeks' hardening. The harder the immediate surface, the less effect produced by the air and the sun on the oil underlying this hard layer.

We come now to the final question in regard to paint for iron—namely, price. I think it may be safely said there is no paint equal to red lead for wrought iron *not thoroughly clean of all kinds of rust*. For perfectly clean iron and for cast iron, iron oxide paint of good quality is quite as good.

If a cheaper paint than even this is wanted, experiment may be made with very finely powdered sand, or, possibly better, slate, if these can be produced cheaply enough. Slate as rough stuff with lead gives a very hard and durable surface, but such substances should always be used with some lead, specially red lead. There seems no reason why cheap, durable powders made very fine and mixed with a little lead soap should not give a very excellent paint.

The Oil.—The value of a paint is its oil, and economy consists in purchasing good oil—the best and purest to be obtained. Adulteration will be advantageous in some cases, but it should be done for a purpose. On roofs 15 to 20 per cent. of fish oil will be an advantage, and on bridges which are not to be frequently repainted, probably a little cotton-seed oil will do no injury.

The principle of adulteration is very simple: the more "elastic" the first coat the more durable, but the greater the tendency to crack the second coat. The weather coat should always be the more "elastic" (containing more not-drying oil), but a man of judgment will discriminate.

The most elastic (in the true sense) of all oils is boiled oil, but it is too thick, and needs to be thinned with raw oil or with turpentine. A priming of such oil thoroughly dried will stick, if a little red lead be added, and if not put on too thick. Boiled oil *thoroughly* mixed with raw oil increases its elasticity, but probably increases the chances that the paint will wrinkle, pit and crawl a little, although if care be taken in the mixing and using, any such effect should be so small as to be imperceptible. There is this strong reason for using more or less boiled oil that the pigment—at least lead-pigment, will more thoroughly unite with and harden the oil, as boiled oil is partly composed of free linseed-oil acid, and we shall thus get more hard soap. At the same time we thus get a harder oil; we always get with the boiled a certain quantity of oil rubber produced by the boiling, and which so long as it remains gives the oil a rubber-like elasticity. It must never be forgotten, however, that both the hardness and elasticity are purchased at the price of color, and that such a paint will certainly yellow—a fact of little consequence, however, unless white or delicate tints are to be used.

The evidence in favor of boiled oil is very clear in many respects. Mulder has shown its value (when properly prepared), and the older testimony in its favor is strong. Of late, however, it has apparently fallen into disrepute, and the reason may be simply its adulteration with rosin.

"Boiled oil," said a New York painter of long experience, "is not what it used to be when we boiled it ourselves. If you lean against the walls of the hallways of our best houses where it has been used it will hold you fast."

(TO BE CONTINUED.)

* If a mixture of white lead and oil dried on glass, or a mixture of white lead and oil be examined under the miroscope, using a high power and passing the reflected direct sunlight through the layer, an optical effect is produced as though the portions not covered by the lead, but centering around each separate particle, consisted of minute drops. Working with direct sun-rays and through glass is productive of optical effects which are uncertain as to their cause, but the appearances in this case are very distinct and may occur under the same condition in other pigments. The precise effect of the lead on the oil, however, is of less consequence. The facts in the case are: (1) that pure carbonic acid lead unmixed with the oxy-hydrate produces with oil an emulsion and not a paint; (2) that only a mixture of 25 per cent. of oxy-hydrate lead brings it to a drying-hard condition; (3) and, although our white lead usually contains more oxy-hydrate than this, it is still improved by substances which do not affect the oil as does the carbonic acid lead. Finally, the oxy-hydrate tested alone unites with the oil with a rise of temperature, showing true chemical action.

† Rose has shown that sulphate of barium (barytes) is acted upon little by little by water, sulphuric hydrogen gas, and possibly sulphuric acid, separated.

Hünefeld has shown that sulphate of lime is decomposable under ordinary circumstances by the galvanic action of two metals in contact. Both barytes and lime, therefore, can give off acid under the conditions to which paint is exposed.

‡ For these facts we are indebted to Messrs. Wisner and Harland, of England, who have done more recent work on white lead than any other chemists.

§ From 70 to 50, and even less, per cent. probably consists of oxide of iron, the remaining 30 to 50 per cent. being of clay and other substances. The question of this substance, therefore, becomes important. Clay has a strong liking for water, and if not soaked with oil will possibly take up and hold a load of moisture. On roofs this is of less consequence, since tin is not itself rusted by such moisture. Here plenty of oil will be used, which the clay will soak up (ochres soak up 75 or 80 per cent.), and this oil will be protected from the sun and the air. Probably for this reason such pigments as Spanish brown are so admirable for roofs.

On iron, however (perpendicular surface), less oil will be used, and the clay, less well protected by oil from water, will be in danger of giving our water-proof layer a moist character. Unfortunately, there seems to be no exact observation, as there is no exact knowledge of the composition of such paints.

"*Iron Oxide* (sesquioxide and hydrated sesquioxide of iron, red and brown hematite).

"What is generally called iron oxide is generally a clay (or chalk), colored with — to — per cent. of iron oxide, and ranging from yellow to brown in color, and in weight accordingly, the lighter shades being unaffected by the magnet. With this inferior material the oil is liable to be absorbed from the iron oxide and the whole to change color and peel off. But 'magnetic paint,' or pure iron oxide, is excellent as a protection from iron, it being sometimes impossible to scrape it off; excellent on woodwork. It is resistant of salt water. It stands sulphurous gases well."

‖ A zinc bar left in a boiler was found to have entirely disappeared, as was supposed, through its protective power over the iron from oxygen.

Ruolz found that zinc-covered iron rusted more rapidly than naked iron under all bare spots.

Elsner found that tin, iron and zinc together set up such a galvanic action as to crystallize the tin into thin plates, which could then be rubbed off.

*Of course the rate would decrease, because the hard surface layer would protect the underlying oil.

† Except as regards the galvanic action between metals decomposing water. There is also some evidence that iron is protective of iron by connection, but it is to say the least capable of two interpretations.

‡ We should not recommend sanding the first coat on iron.

National Association, General Passenger and Ticket Agents.

We give herewith, nearly in full, the official report of the proceedings of the convention held in Montreal, beginning Sept. 19:

Convention was called to order at 11 a. m., the President, E. P. Wilson, in the Chair.

The roll was called and a quorum found to be present.

The following is the list of members present; those marked with a * have become members since last convention.

Allen, D. C., South Carolina Railroad.
Ames, W. O., Florida Central & Western.
Anthony, W. M., Boston, Barre & Gardner.
Archer, John J., Scioto Valley.
Atmore, C. P., Louisville & Nashville.
Affleck, E. T., Cleveland, Akron & Columbus.
Baldwin, H. P., Central of New Jersey.
Baldwin, Wm. S., Buffalo, Pittsburgh & Western.
Bennett, W. B., Toledo, Ann Arbor & Grand Trunk.
*Best, J. H., Keokuk & St. Louis Line.
Bodine, John F., Williamstown Railroad.
Boothby, F. E., Maine Central.
Boylston, S. C., Charleston & Savannah.
*Brown, J. W., Bay Line Steamers.
Butterfield, Theo., Utica & Black River.
*Brown, Chas. L., Kentucky Central.
*Busby, A., Intercolonial.
Byington, E. B., Lehigh Valley.
Campbell, Geo. B., Fort Wayne, Cincinnati & Louisville.
Carpenter, T. P., Lake Superior Transit Co.
*Clark, A. E., New York, Pennsylvania & Ohio.
Case, Munson T., Green Bay, Winona & St. Paul.
Chandler, F., Missouri Pacific.
* Coleman, J. W., Chicago, St. Louis & New Orleans.
* Cummings. S. W., Central Vermont.
Connor, Geo. L., Old Colony Steamboat Co.
* Davis, H. C., St. Paul, Minneapolis & Manitoba.
Danley, W. L., Nashville, Chattanooga & St. Louis.
Deal, T. M., Mississquoi.
* Drane, Frank C., Iron Steamboat Co.
Durfee, W. M., Providence & Worcester.
* Elliott, J. M., Jr., Gadsden & Red Line Steamers.
Egan, John, Cincinnati, Indianapolis, St. Louis & Chicago.
* Emmerson, T. M., Atlantic Coast Line.
* Fenwick, Chas. B., De Bary Merchants' Line.
Filkins, L. W., Stonington Steamship Line.
Flanders, D. J., Boston & Maine.
* Fenno, John A., Boston, Revere Beach & Lynn.
Ford, E. A., Pittsburgh, Cincinnati & St. Louis and Pennsylvania Co.
Foye, Chas. H., Portland & Ogdensburg.
Fuller, H. W., Chesapeake & Ohio.
Gabbett, Cecil, Western of Alabama.
Hooper, S. K., Hannibal & St. Joseph.
Hancock, C. G., Philadelphia & Reading.
Harrison, F. E., New Haven & Derby.
Harrison, W. H., Columbus, Hocking Valley & Toledo.
*Hill, Wm., Chicago & Eastern Illinois.
* Heald, F. O., Fitchburg.
* Hall, Jas. M., Wheeling & Lake Erie.
* Hurlburt, W. H., Canada Southern.

* Haas, Sol., Associated Railways of Virginia and the Carolinas.
Jaques, E. A., Lebanon Springs.
Kingsbury, F. H., Cheshire.
Kendall, A. C., New York & New England.
Kendrick, D. M., Delaware & Hudson Canal Co.
Keller, Murray, Louisville, New Albany & Chicago.
Leavitt, J. F., European & North American.
Leet, A. B., Grand Rapids & Indiana.
Littlefield, James, Boston & Bangor Steamship Co.
Lowell, Percival, Chicago, Burlington & Quincy.
Liscomb, C. F., Portland Steam Packet Co.
MacDonell, A. O., Florida Transit Co.
Milligan, F., Detroit, Mackinac & Marquette.
* Morse, J. W., Union Pacific.
Morse, F. W., Montpelier & Wells River.
*Merkill, R. D., Jr., Quebec Central.
Nimmo, C. A., Troy & Boston.
Orme, A. J., Atlanta & West Point.
Pierce, T. W., Jr., Galveston, Harrisburg & San Antonio.
Pope, A., Shenandoah Valley, Norfolk & Western and East Tennessee, Virginia & Georgia.
*Palmer, J. H., Massachusetts Central.
* Pearce, Walter, Hartford & Connecticut Western.
Ray, E. A., New Haven & Northampton.
* Simmons, W. F., Northern (N. H.)
* Slaughter, Mercer, Richmond & Danville.
Stirson, I. D., Shenango & Allegheny.
Stebbins, C. S., Union Pacific.
Smith, A. J., Cleveland, Columbus, Cincinnati & Indianapolis and Indianapolis & St. Louis (Bee Line).
* Spafford, H. W., Bennington & Rutland.
Sprague, J., Jr., Old Colony.
* Stevens, C. H., St. Johnsbury & Lake Champlain.
Taylor, C. A., Richmond, Fredericksburg & Potomac.
Taylor, Jas. L., Savannah, Florida & Western.
Thrall, W. A., Chicago & Northwestern.
* Tompkins, H. V., St. John's River Steamers.
Townsend, H. C., Wabash, St. Louis & Pacific.
Tuttle, L., Eastern (Mass).
* Utley, E. H., Allegheny Valley.
Van Benthuysen, C. R., Hudson River Line Steamers.
Waller, Chas. J., Mobile & Ohio.
* White, A., Midland of Canada.
Whitehead, G. A., Central of Georgia.
Wilder, J., Boston, Hoosac Tunnel & Western.
Williams, D. E., Mobile & Girard.
Wilson, E. P., Cincinnati Southern.
Wishart, D., St. Louis & San Francisco.
Wood, J. R., Pennsylvania.
Wrenn, B. W., Western & Atlantic.

Honorary Members present:

Dixon, W. H., Chicago, Ill.
Snow, F. E., Detroit, Mich.

Total number of members, 150; number present, 98.

Special credentials for this meeting were presented as follows:

By F. W. Clark, representing Seaboard Air Line.
By J. G. Pangborn, representing Baltimore & Ohio Railroad.

The next order of business was the making of passenger rates.

It was moved by Mr. Thrall and seconded by Mr. Atmore, that the making of passenger rates be dispensed with.

In the absence of any objection, the Chair declared the motion carried.

The selection of next place of meeting being next in order, the following points were placed in nomination: Norfolk, Jacksonville, Niagara Falls, New Orleans and New York. Ballotting resulted in the choice of Jacksonville, Fla., as the place.

Unfinished business being next in order, the Chair filled vacancies in standing committees as follows: S. W. Cummings, successor to W. J. Houston, in Executive Committee.

J. C. Zimmer, of the General Committee, having withdrawn, the Chair appointed Mr. T. M. Emmerson, of Wilmington, N. C., to fill the vacancy, and no objections being offered both appointments stood confirmed.

The next business in order was the report of the Commitee of Fifteen on the coupon ticket question. The Secretary read the preliminary report as presented to the meeting of 1881, in St. Louis, and on motion, duly seconded, said Committee was given further time.

A reconsideration of the vote upon which the committee was allowed further time on the forgoing question was next moved, seconded and carried.

It was then moved and seconded that the Chair fill the vacancies in the committee, and that such committee be requested to report to the Association at this session. An informal discussion ensued, which was participated in by many of the members, after which the Chair put the question, and it was carried unanimously.

To fill vacancies caused by absentees, the Chair made the following appointments to which there were no objections: Messrs. Atmore, Fuller, Boylston, Cummings, Whitehead, Townsend, Lowell, Pangborn, Pope, Thrall, Danley, A. White, Slaughter, Wood and Wrenn.

The next business in order was the report of the Committee of Fifteen on continuous passage tickets. An informal discussion followed, after which it was resolved that the committee appointed to consider the subject of Coupon Tickets be instructed to report to the Association on Wednesday, Sept. 20, at 10 a. m., and that their report be made the special order of business at that hour.

The next subject brought up for consideration was the continuous-passage ticket question.

It was resolved "that the Committee on Continuous-Passage Tickets be instructed to report to the Association at its afternoon session, and that its report be made the special order of business at the opening of said session."

The Chair named the members of the committee as follows: Messrs. Atmore, Wilson, Boylston, Boyd, Thrall, Wilder, Campbell, Townsend, Chandler, Charlton, Ford, Waller, Johnson, Lord and Abbott.

The next matter for consideration was the report of the General Committee, on rates for transportation of theatrical troupes in special cars.

As the committee had no report to make, the whole matter was laid on the table, and an adjournment was had until 3 p. m.

AFTERNOON SESSION.

Convention called to order at 3 p. m., the President, E. P. Wilson, in the chair.

The committee having in charge the item of business which had been made the special order for this session not being ready to report, the Secretary, by unanimous consent, read a communication addressed to him by W. H. Dixon, Secretary of the Chicago Railroad Association, calling attention to the following action of that Association at a recent meeting:

"Knights Templar Triennial Conclave, at San Francisco, in 1883—Secretary was instructed to bring the matter to the attention of the National Association, and to recommend that the lines east of the Missouri River adopt the same basis for rates as is used by the Pacific lines, viz: one fare for the round trip, going and returning the same way; and one and one-quarter fares for the round trip, going by one route and returning by another."

A lengthy discussion on this matter took place, and was participated in by Messrs. Atmore, Wrenn, Ford, Stebbins, Townsend, Pope and others, and a motion to refer same to General Committee was lost by a vote of 11 to 8.

No objection being offered, the Chair announced that the further discussion would be deferred until recalled under the head of miscellaneous business. The special order of business was taken up, which was the report of the Committee on Continuous Passage Tickets, who reported as follows:

"Your Committee beg leave to report that after a thorough correspondence with the various members of the Association, a draft of a ticket was prepared and presented and by your committee submitted to the Western Association of General Passenger & Ticket Agents, examined and discussed at their session in Chicago, and again at their session in Detroit, each discussion inducing varied alterations. Your Committee have further re-examined and discussed the ticket, and, whilst not entirely harmonious in their conclusions, beg leave to submit to the Association for its consideration the propriety of adopting a contract for a ticket as attached."

On motion, it was decided to consider the question of the adoption of form of the ticket submitted by sections, with the following result: Clauses 1, 2, 3, 4 and 5 were adopted without objection.

A lengthy discussion took place on clause 6, which was participated in by Messrs. Chandler, Stebbins, Thrall, Taylor, Wood, Wrenn, Townsend, Boylston, and, on motion, adjournment was had until 10 a. m., Sept. 20.

SECOND DAY.

Convention called to order at 10.30, the President, E. P. Wilson, in the chair.

The special order of business being the report of the Committee on Coupon Tickets, on motion, the Committee on Coupon Tickets was instructed to report at the next regular meeting.

Continuous passage ticket question was taken up and clause 6 amended and adopted; clauses 7, 8 and 9 adopted; clause 10 amended and adopted; clauses 11 and 12 adopted.

The concluding portion of the contract was then read and adopted, and the ticket as a whole adopted by the Association as passed in sections.

The following is a sample of the ticket as adopted:

Chicago & North Western R'y.

GOOD FOR ONE PASSAGE

—TO THE—

Point and of the Class Designated on

COUPONS ATTACHED,

When officially stamped subject to the following conditions:

1st. In selling this Ticket this Company acts as Agent, and is not responsible beyond its own line.

2nd. It is subject to the stop-over regulations of the lines over which it reads.

3rd. It is void if altered, or if more than one date is canceled.

4th. If the Coupons are marked "SECOND CLASS" the passenger is entitled to **Second Class** passage only, otherwise **First Class.**

5th. If this Contract and its Coupons bear no L cancellations the Ticket is unlimited.

6th. When a date is canceled by L punch in margin hereof, it indicates that this Ticket was sold at a reduced rate and is therefore limited, is not transferable, and is subject to exchange, in whole or part, for a Continuous Passage Ticket, and it will not be honored by any road by which it reads unless presented in time to reach its destination by or before midnight of the date so canceled.

7th. If signed below by the purchaser this Ticket is **not transferable** whether unlimited or limited.

8th. Any unused portion of this Ticket with the contract attached may be redeemed. The holder should apply to the General Ticket Agent of the first line over which such unused portion reads.

9th. The Coupons belonging to this Ticket will not be received for passage if detached.

10th. The holder will identify himself or herself as the original purchaser of the ticket by writing signature, or by other means if necessary, when required by conductors or agents.

11th. Baggage liability limited to wearing apparel not exceeding $100 in value.

12th. That the right is reserved to each road over which this ticket reads to check baggage to final destination only.

☞ **No agent or employe of any line named in this Ticket has power to alter, modify or waive any condition of this contract.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Day 1		2 3 4 5 6 7		8 9 10		11 12 13 14 15 16 17		18 19 20		21 22 23 24 25 26 27	28 29 30 31
1882											
1883											
1884											
1885											
1886											
1887											
1888											
1889											
1890											
1891											

W. A. THRALL,
General Ticket Agent.

I hereby agree to all the conditions of above contract.

..... *Purchaser.*

..... *Witness.*

..... 188 .

The following resolutions, adopted by the General Baggage Agents' Association were next read and referred to the General Committee:

"*Resolved*, That it be the sense of this meeting that the cost of joint checks, reading over two or more roads, be prorated on the basis of the longest haul that can be obtained in any one direction from junction to terminal or connecting point; and that this resolution be submitted to the National Association of General Passenger & Ticket Agents for their consideration and approval."

"*Whereas*, The practice of collecting storage charges has been introduced by most of the lines represented in this Association with very satisfactory results, be it

"*Resolved*, That we recommend and urge its general adoption; and it is further the sense of this meeting that this system should be adopted by all lines so far as practicable, and at such rates and time as is in general use throughout the country, and we hereby recommend the same for ratification by the National Association of General Ticket Agents."

The following resolution was adopted:

"*Resolved*, That, to throw a proper safeguard around the issue of passes, we hereby agree to require all requests for such favors coming from traveling agents, passenger agents, ticket agents, and other subordinates of the passenger department to be first favorably indorsed by the General Passenger Agent or General Ticket Agent of the line in whose employ the applicant may be.

"*Resolved*, That a printed copy of these resolutions shall be sent to each applicant, when his request is received, thus advising him that it has been referred to his superior officer for indorsement."

The following was offered and seconded, and after some discussion by Messrs. Chandler, Wrenn and Stebbins, was adopted unanimously:

"*Resolved*, That a Committee of Fifteen be appointed by the President, to meet at the call of its Chairman not later than Nov. 1, 1882, to fix rates from Chicago, Peoria and Mississippi River common points to San Francisco and return for the triennial conclave of Knights Templar, in August, 1883, and that the Chairman of such Committee shall report its action, by circular, to all members of this Association not later than Jan. 1, 1883."

The Chair appointed the following-named gentlemen to serve on the Committee: Messrs. Chandler, Townsend, Wishart, A. V. H. Carpenter, Thrall, St. John, Hooper, W. F. White, Stebbins, Teasdale, Schriever, Pearce, Roberts, Lowell, Charlton.

The following resolution was next adopted:

"*Resolved*, That the matter of rates from Chicago, Peoria and Mississippi River common points to Denver, for the national encampment of the Grand Army of the Republic, in June, 1883, be referred to the Committee on Rates to San Francisco for Knights Templar, with instructions and authority to act thereon in the same manner as upon the rates for the Knights Templar."

The following was offered, seconded, and upon coming to a vote was declared lost:

"*Resolved*, That it is the sense of this Association, that in lieu of according to the agents or other proper classes of employes of other lines and their families free passes, a reduced rate of fare be granted them on the application of their General Passenger & Ticket Agents, said rate not to be less than one cent per mile for distance traveled."

The following was next offered, and a lengthy discussion followed, which was partic pated in by Messrs. Morse, Stebbins, MacDonell, Taylor, Emmerson, Orme, Gabbett, Pope, Townsend, Hooper and others, and on coming to a vote was declared lost:

"*Resolved*, That it is the sense of this Association that a rate of one-half the regular unlimited first-class fare should be used for the families of employés of transportation lines, said rate to be used and tickets sold only at the discretion of the General Ticket and Passenger Agents themselves."

The following gentlemen were nominated as honorary members, and no objection being offered the Secretary was instructed to inform them of their election as such: Messrs. Geo. H. Daniels and Ellis Clark.

After passing the usual resolutions of thanks, etc., the convention adjourned.

The Vermont Central Decision.

The decision of the Vermont Supreme Court in the Langdon suit was published some six weeks ago, the Court holding that both the Vermont Central and the Vermont & Canada roads were subject to the lien of the so-called trust debt, that debt constituting an "equitable mortgage" prior to all other liens. It now appears that Judge Taft dissented from the majority of the Court, so far as the Vermont & Canada road is concerned, and his opinion is as follows:

Without entering at length into a discussion of the various legal questions involved in this case, I desire to enter my dissent from the opinion of the Court upon one of the most important points.

I cannot concur with my brethren in holding that the indebtedness of the managers of the property in question constitutes a lien, or can be made a charge upon the Vermont & Canada Railroad. It is said that this question is *res adjudicata*. I do not so regard it, notwithstanding what is said in the opinion in this case, reported in the 53d Vermont, p. 283. I consider it an open question. I do not deem it material upon this hearing to pass upon the question of the particular character in which the managers have been acting. They were either strict receivers or managing agents in control of the property by the consent of the owners. Acting in either capacity, the ordinary rule applicable in case of receivers would apply. The managers would be entitled out of the funds to their costs, charges and expenses properly incurred in the discharge of their ordinary duties, or in extraordinary services, which have been sanctioned by the Court. I am aware that in some instances repayment to the managers of the property of advances made by them has been ordered out of the *corpus* of the estate—Kerr on Receivers, 2d Am. ed., p. 239. And this latter rule, I think, is properly applied in this case, as against the Vermont Central Railroad and its mortgagees. All that, I think, has as yet been decided by this Court—using the words of Judge Redfield—is "that a court of equity would charge the *property which was the subject of the receivership*, created by the Court in 1861 in behalf of the *bona fide* holders of such bonds (those issued by the managers), with an equitable lien, and cause it to respond in payment of such debts." It is in determining what the "funds" or the "property which was the subject of the receivership" was, that I think the Court has erred.

The receivership was originally ordered by reason of the default of the Vermont Central Railroad Company. That corporation is what I regard as the *primary* party; and it is the property of that corporation that I insist is the "subject of the receivership." What was that property? There is no contention upon that point. It was the road-bed and rolling stock of the Vermont Central Railroad Company, and the rights of the latter company to the possession and use of the Vermont & Canada Railroad under the leases of 1849 and 1850; in consideration of which possession and use certain rent was to be paid by the Vermont Central Railroad Company to the Vermont & Canada Railroad Company. The two roads were as distinct after the leases as before. Their organizations were separate, and there was nothing in common between the two. Each company owned its own road-bed, and one had by contract a right to use the road-bed of the other, and was under obligation to pay rent for such use. The estate of the Vermont Central Railroad Company in the road-bed of the other company was that of a lessee—a leasehold estate—and the receivers took the property with the same rights, and subject to the same obligations, as it had heretofore been held by the lessee. Where a receiver is appointed of a leasehold estate, the performance of all the obligations imposed by the possession of the land devolves upon him, and he is bound, in the first place, out of the sub-rents or receipts, to discharge the head rent, where the right of the landlord is undisputed, without an order for that purpose. In the case at bar the rent due the lessor was paid and discharged until the year 1872. Until that time, as its rent had been duly paid, the Vermont & Canada Railroad Company had no cause for complaint. Since that time it has been earnestly protesting against the possession of the present managers. Upon what principle, then, of law or equity, the property of the Vermont & Canada Railroad Company can, in the way proposed, be taken to pay the expenses of the trust, I am unable to determine; and for this reason I dissent from the conclusion at which my brethren have arrived. That corporation is, of course, liable for all obligations which they

have *lawfully* assumed, and the holders of such obligations have in respect thereto a full and adequate remedy at law; but they have no right to a foreclosure of the property of the company in question, as they have no lien upon it, possessing only the rights of an ordinary creditor. It may be said that, as the receivership was originally created upon the petition and at the request of the Vermont & Canada Railroad Company, if the property, which was the subject of the trust (and which I have above referred to, as the Vermont Central Railroad and equipment and its leasehold estate in the Vermont & Canada Railroad), is not sufficient to pay the expenses and debts of the management, that the company are liable to make good any deficiency. Admitting such liability on the part of the Vermont & Canada Company, upon what principle can it be claimed that the proper way of enforcing it is by a general foreclosure of the property of the trust and that of the *cestui que trust* combined? I am aware of no law or practice authorizing it in this state; and in my opinion there should be none. While I do not object to the disposition of the case as to the special pledges of the equipment, I think it would have been the better way to have ordered a foreclosure as to them, and, if unredeemed, have applied the value of the property upon the claims for which it was specifically pledged; and, if insufficient to pay the amount secured, have admitted the holders of that debt as general creditors of the trust for the amount unpaid. But the cause ordered violates no legal or equitable principle.

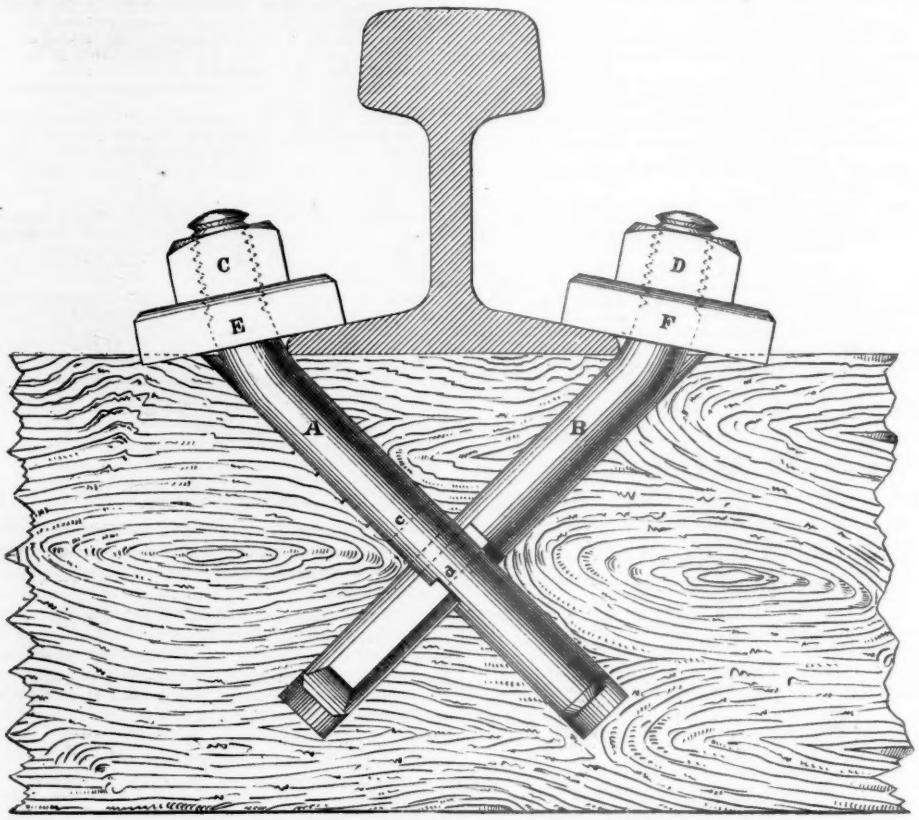


Fig. 1.

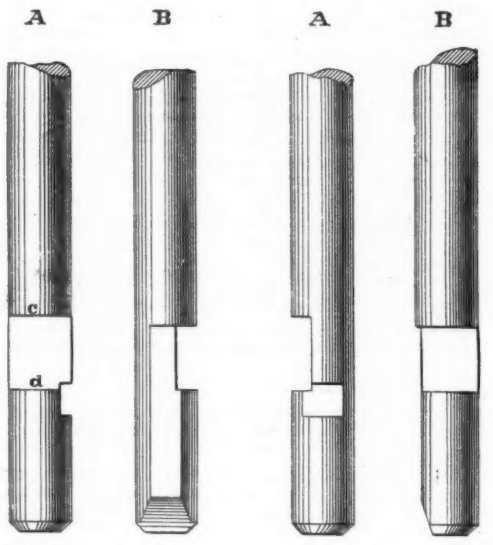


Fig. 2. Fig. 3. Fig. 4. Fig. 5.

BUSH'S INTERLOCKING TRACK BOLTS.

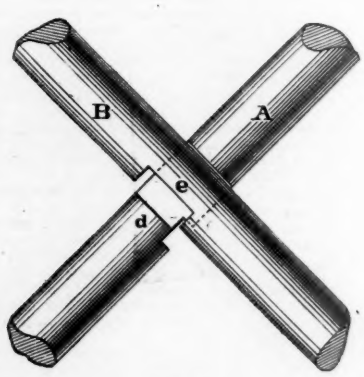


Fig. 6.

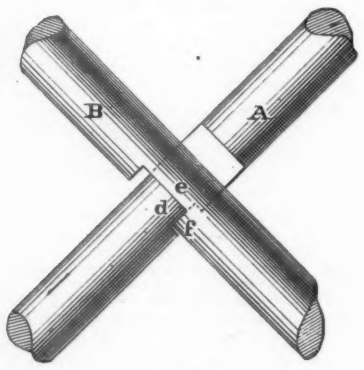


Fig. 7.

Bush's Interlocking Track Bolts.

The engravings, figs. 1 and 2, represent a form of bolts patented by Mr. Thomas J. Bush, of Lexington, Ky., and intended for bolting down rails and for similar purposes.

Fig. 1 shows a transverse section of a rail and a longitudinal section of a tie, with the bolts inserted in the latter and with their nuts screwed down so as to hold the rail securely to the tie. The bolts, it will be seen, are inserted in holes which are not bored entirely through the tie, and are not in the same plane, the centre of the one being far enough on one side of the other so that the bolts can be inserted without interfering with each other. The bolts are each notched in such a way that the one will lock or hold the other. The form of the notches is shown in figs. 2 to 5. The bolt *A* is inserted in its hole first and is driven down to the bottom of the hole so as to permit *B* to be inserted. To give a clear idea of the way the two bolts engage with and hold each other, figs. 6 and 7 have been drawn; they represent the intersection of the bolts looking from the opposite side from that from which fig. 1 is seen. That is, the bolts are shown just as though fig. 1 was turned over. In fig. 6 *A* is shown in the position it is in when driven down to the bottom of the hole. When it is in this position the bolt *B* can be inserted and can pass the shoulder *d* on *A*. After *B* is inserted *A* is screwed up so that it is drawn into the position shown in fig. 7. It will be seen that when this is done that the shoulders *d* and *f* engage with each other, and that *B* is securely locked in that position by the shoulder *d* on the bolt *A*. At the same time the shoulder *d* engages with the bolt *B* at *c*, so that *A* is locked by *B*, and therefore both bolts, or rather the nuts *C* and *D*, fig. 1, can both be screwed up on the plates *E* and *F*, and the rail will then be securely held to the tie. The strength of the fastening will, of course, depend upon the resistance which the wood offers to the bolts. To determine how much this is the inventor had some tests made at the mechanical laboratory at the Stevens Institute, of which Professor Thurston made the following report: The first series of tests was made by attaching a lever to the head of the rail, as shown in fig. 8, and loading the end of the lever. The second series was made by attaching a clamp to the head of the rail, as shown in fig. 9, and exerting a direct pull on the rail-head. The tests, it will be noticed, were made with a rail fastened with ordinary spikes, screw spikes and Bush's interlocking bolts. The superior strength of the bolts is shown by comparing the results given in the different columns.

In using these bolts it is important that the holes for them should be bored to the right angles and the exact distance apart so that the bolts will intercept each other accurately. To do this work Mr. Bush has devised a gauge, which is shown by figs. 10 and 11. This is clamped to the rail by the clips *F F* and hand screws *G G*. The auger *H H* is inserted in guiding holes, *J* and *K*, which adjust its position correctly on each side of the rail.

These bolts have been put down for the purpose of testing their merits on the Elevated Railroad near Rector street station, and also on the New York Central near the Grand Central depot in New York, on the New York City & Northern near Ashford, and at Lexington Ky., on that division of the Chesapeake & Ohio Railroad.

The tests indicate that these bolts are an effective preventive of the creeping of rails.

It is a remarkable fact that although the weight and size of rolling stock has been enormously increased of late years, there has been no corresponding addition to the strength of the fastenings which hold the rails to the ties. Screw spikes have been used, it is true, but with little success. From the tests above it will be seen that the interlocking bolts give much greater strength than screw spikes. For curves and bridges, or other localities where great security is demanded, the interlocking bolts would certainly make a much stronger fastening than either ordinary or screw spikes. Another advantage which they possess is that in order to remove a rail it is not necessary to withdraw them from the ties, but simply to slack up the nuts so as to release the washers or plates which bear on the rail flanges. When these plates are loose the rail can be slipped out.

The New Chicago Lines.

The following descriptions of two of the new lines now nearly finished to Chicago from the eastward are from official sources:

NEW YORK, CHICAGO & ST. LOUIS.

The maximum grade going east, from Chicago to Dunkirk, is 20 ft. per mile; between Dunkirk and Buffalo, (about 40 miles) the grades are heavier, and trains will have to be divided. Going west, between Buffalo and Chicago, the maximum grade is 30 ft. per mile. The maximum curvature is three degrees; there is about 92 per cent. of straight line. About 60 per cent. of the line is level.

Leaving Grand Crossing, Ill., the line runs from one to eight miles south of and generally parallel to the Pittsburgh, Ft. Wayne & Chicago through Valparaiso, Knox, Argos and South Whitley, Ind., to Ft. Wayne, passing through the centre of the city, along the route of the old canal, and thence to New Haven, six miles, parallel to the Wabash, St. Louis & Pacific. From New Haven, Ind., to Arcadia, O., is the longest tangent on the road, 85 miles. From Arcadia the line runs more to the northeast through Fostoria, Green Springs and Bellevue to Vermillion, whence it follows the Lake Shore to Lorain and Cleveland. From Cleveland east to Buffalo the line is generally parallel to and just south of the Lake Shore & Michigan Southern Railway, passing through all the prominent points between the cities named.

In passing through Cleveland it was desired to do away with, as far as possible, the crossing of railroads and streets at grade, and the delays and dangers incident thereto, to avoid the flats, and to keep within the maximum grade. The importance of securing this end in the first cost of construction is the more apparent when we consider the expense the New York Central road is now being put to, in raising its tracks through Rochester, N. Y., where it already had a large amount invested in permanent way; and its desirability is evident to any one familiar with the lines of the other railways passing through Cleveland. The road has been built through the city with but one railroad crossing (Cleveland & Pittsburgh) at grade, and passes under one and over four other lines; while street crossings at grade have been made as few as possible, there being but one or two important streets crossed at grade. Through Cleveland there will be about 18 miles of second track, most of which is already built. To do all this necessitated considerable heavy work—the heaviest met with on the line. The Cleveland viaduct is double track, 3,000 ft. long, including a draw-span of 225 ft., and is from 60 to 70 ft. high; besides this, in the city there are several minor double-track bridges, aggregating 3,128 ft. in length, making a total of 6,116 ft. of double-track wrought-iron bridging in Cleveland. The earthwork in the city is very heavy, and embraces heavy cuts and fills and side-hill work; besides this there is little heavy earthwork to speak of on the line. The road has, as it were, been built on top of everything, and may fairly be called an "embankment" road, and there are consequently few cuts, the chief object being to obtain safe and perfect drainage, which is assured. There are some heavy fills, and between Buffalo, N. Y., and Huron River, O., it was necessary to use a large amount of bridging; several of these structures are

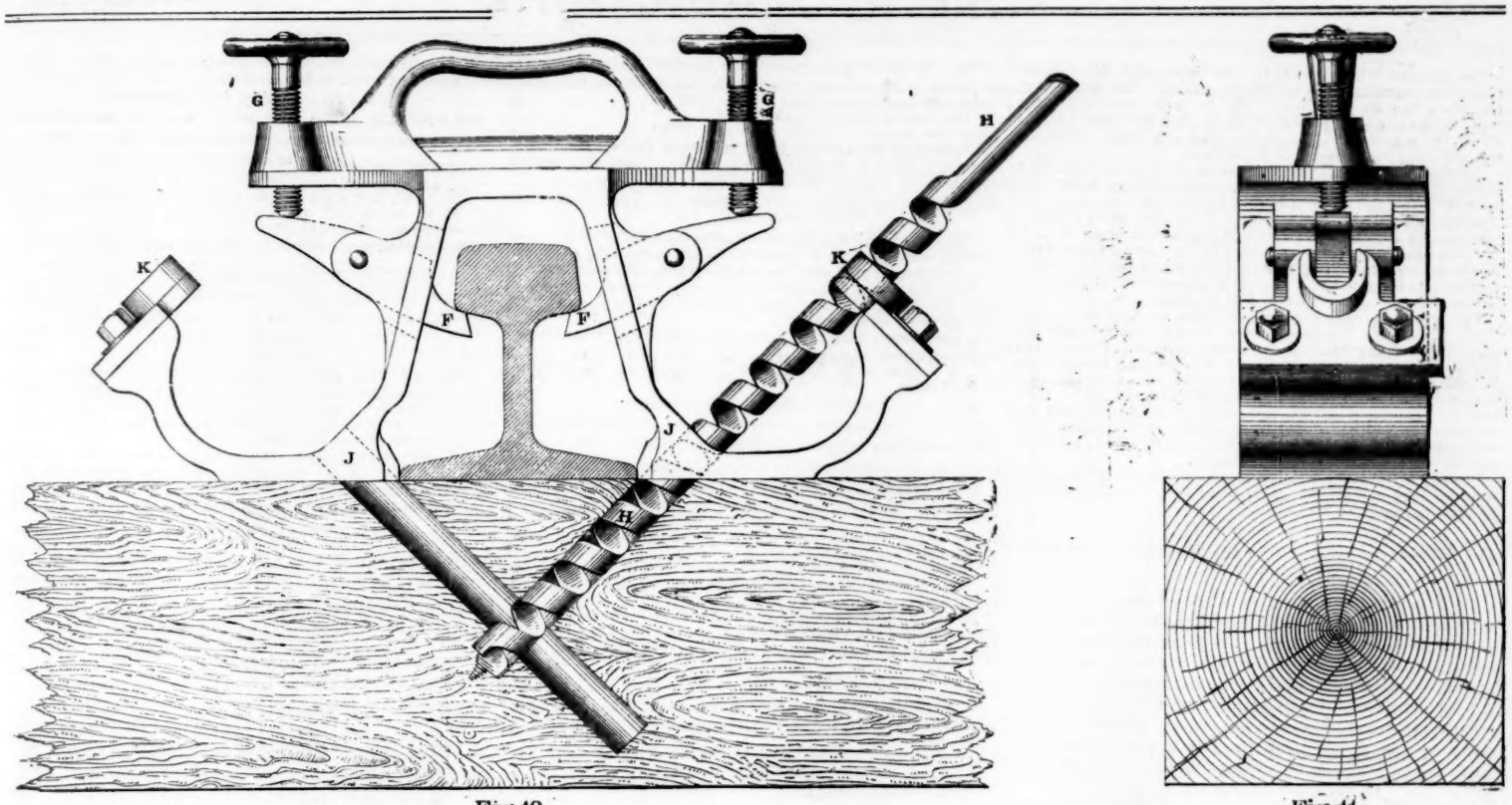


Fig. 10. Fig. 11.

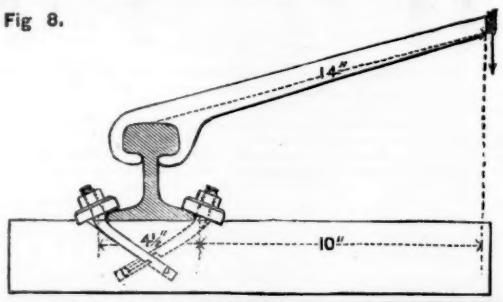
GAUGE FOR BORING HOLES FOR BUSH'S INTERLOCKING TRACK BOLTS.

Record of First Series of Tests by Tension of Rails fastened to yellow pine and oak with patent bolts and spikes, Mechanical Laboratory Department of Engineering, Stevens Institute of Technology.
Material—Patent bolts, screw spikes, ordinary spikes. Investigation—Relative strength to resist bending and drawing of spikes and bolts by a lever arm.

Kind of material to which rail is fastened.	Rail fastened with two ordinary rail spikes 5/8 × 5 in.	Rail fastened with two screw spikes, 5/8 in. diam. × 5 in.	Rail fastened with two of Thos. J. Bush's patent interlocking bolts.
Fastened to yellow pine tie, 7 in. square, 3 ft. long.	*Lab. No.* 2,569. Spike commenced to draw with a load of 800 lbs. (Foot lbs. of moment, 665 lbs.)	*Lab. No.* 2,571. Spike drew out and spread at a load of 1,000 lbs. (Foot lbs. of moment, 833 lbs.)	*Lab. No.* 2,575. Drew up ¼ in. at 1,500, but sprung back to original place when load was removed. Broke bolt head at 1,750 lbs. (Foot lbs. of moment, 1,455 lbs.)
Fastened to oak tie, 7 in. square, 3 ft. long.	*Lab. No.* 2,570. Forced up spike at 1,300 lbs. (Foot lbs. of moment, 1,065 lbs.)	*Lab. No.* 2,574. Broke spike in tie at 300 lbs. (Foot lbs. of moment, 250 lbs.)	*Lab. No.* 2,576. Drew at 1,800 lbs., and returned to original place when load was removed. Broke off head of bolt at 2,000 lbs. (Foot lbs. of moment, 1,665 lbs.)

R. H. THURSTON, Director.

Fig. 8.

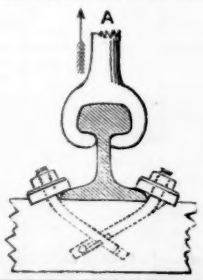


Record of Second Series of Tests by Tension Rails, in which pine and oak fastened with patent bolts and spikes, Mechanical Laboratory, Department of Engineering, Stevens Institute of Technology.
Investigation to test relative tendency to be drawn out of its fastenings.

Kind of material to which the rail was fastened.	Rail fastened with two ordinary rail spike 5/8 × 5 in. driven in tie.	Rail fastened with two screw spikes 5/8 in. diam. × 5 in., weight each 6½ oz.	Rail fastened with two of Thos. J. Bush's interlocking bolts. ¾ in.
Fastened in yellow pine tie, 7 in. square.	*Lab. No.* 2,559. Gave away suddenly at 6,000 lbs. *Lab. No.* 2,565. Drew out at 2,500 lbs.	*Lab. No.* 2,558. Pulled out ½ in. at 6,000 lbs. *Lab. No.* 2,564. Pulled up and spread spike at 5,000 lbs.	*Lab. No.* 2,557. Sheared wood and split tie at 5,500 lbs. *Lab. No.* 2,563. Sheared wood at 6,800 lbs.
Fastened in oak tie, 7 in. square.	*Lab. No.* 2,562. Broke head and spread spike at 6,500 lbs. *Lab. No.* 2,566. Pulled up and spread spike at 8,500 lbs.	*Lab. No.* 2,561. Spread spike at 5,500 lbs. *Lab. No.* 2,568. Pulled up and spread both spikes at 5,000 lbs.	*Lab. No.* 2,560. Broke off bolt head at 10,700 lbs. *Lab. No.* 2,567. Bolt head broke and wood partly sheared at 10,200 lbs.

R. H. THURSTON, Director.

Fig. 9.



METHOD OF TESTING—Tie fastened down and pulled at *A*.

worthy of notice, and from Buffalo westward are as follows:

Eighteen-mile Creek	690 ft.	long, 98 ft.	high.
Westfield	592 "	" 62 "	"
State Line	712 "	" 110 "	"
Swanville	870 "	" 97 "	"
Girard	1,470 "	" 99 "	"
Springfield	690 "	" 99 "	"
Conneaut	1,320 "	" 73 "	"
Ashtabula	822 "	" 116 "	"
Painesville	1,310 "	" 114 "	"
Rocky River	670 "	" 80 "	"

Besides several other minor structures, making a total of 10,049 ft. of single-track wrought-iron bridges, most of which are Fink truss, deck bridges.

The principal shops of the company are located at Chicago; and there will be division shops at Ft. Wayne, Ind., and Bellevue and Conneaut, O. The divisions for engine service will be: Buffalo to Conneaut; Conneaut to Bellevue; Bellevue to Ft. Wayne, and Ft. Wayne to Chicago.

The track is laid with 60-lbs. steel rails, broken joints (with the exception of a portion of the line on the western end which is laid with 56-lbs. steel); angle bars are used for main track and plain for sidings. Split switches are generally used, and the track is now thoroughly ballasted the entire distance. The local stations along the line are all built, and work on passenger stations at Erie, Cleveland and Ft. Wayne is well in hand. There are now built and equipped 30 water stations, with a capacity of 60,000 gallons each.

The passenger equipment is being built by the Pullman Company at Chicago. All the freight cars of the company are of standard designs, and have a capacity of 40,000 pounds each. Most of the locomotives are being and have been built by the Brooks Locomotive Works, and are of the heaviest weights; the larger passenger engines being 18 by 24 in. and the heavier freight engines being ten-wheel pattern, with 19 by 24 in. cylinders.

CHICAGO & ATLANTIC.

This road is 249.1 miles in length, from Marion, O., to the Illinois state line (Hammond), where connection is made with the Chicago & Western Indiana road, which will supply an entrance into Chicago and terminal facilities in that city.

Of the whole length of 249.1 miles, 96 per cent. is tangent; 0.16 per cent. three-degree curves; 0.70 per cent. two-degree curves; 2.74 per cent. one-degree curves, and 0.40 per cent. one-half degree curves.

The maximum grade is 26 ft. per mile, and the longest continuous grade at that rate is 3½ miles. The grades on the whole line are as follows: 26 ft. per mile, 23.0 per cent. of the whole length; 21 to 25 ft., 2.5 per cent.; 16 to 20 ft., 3.3 per cent.; 11 to 15 ft., 10.1 per cent.; 10 ft. or less, 30.4 per cent.; level, 30.7 per cent.

The road crosses 11 streams with bridges as follows: Scioto River, two spans of 100 ft., iron; Ottawa River, one span of 75 ft., and at second crossing one of 100 ft., iron; Auglaize River, one span of 100 ft., iron; St. Mary's River, one span of 150 ft., iron; Little Wabash, one span of 150 ft., iron; Eel River, one span of 175 ft., iron; Tippecanoe River, two spans of 100 ft. each, iron; Kankakee River and marsh, pile-trestle; Little Calumet and marsh, pile-trestle; Grand Calumet, draw-span of 140 ft., iron.

The road is laid throughout with 60-lbs. steel rails from the Edgar Thomson Steel Works, jointed with the standard railway joint of improved pattern. Twenty-five locomotives are in the shops of the Brooks Locomotive Works, nearly ready for delivery, and an extensive passenger equipment is being built at Wilmington, Del. Pullman's Palace Car Co. will have charge of the sleeping-car service over the road. The freight equipment is being built at Lima and Cleveland, O. There are also 25 engines and 600 cars now in use in construction.

The capital stock of the company is $10,000,000 and its bonded debt $6,500,000, making a total of $16,500,000, or $66,000 per mile.

The Standards Adopted by the Master Car-Builders' Association.

Inquiries are often made for a list of the standards of various kinds which the Master Car-Builders' Association has heretofore recommended. The following record of resolutions of different kinds and of the action of the Association on various subjects has been made from the annual reports. The list embraces all the standards that have thus far been recommended, and some other resolutions intended to be of permanent effect, and gives the date and page of the published annual report on which the resolution can be found.

FIFTH ANNUAL CONVENTION.

At the fifth annual convention, held in Richmond, Va., in 1872, the following resolutions were adopted:

DICTIONARY OF TERMS.
(Page 18.)

"*Resolved*, That a committee be appointed with power to publish an illustrated book, defining the proper terms or names of each and every part used in the construction of railway cars, and a description of the use of the same." (See also report of 1880.)

SCREW THREADS.
(Pages 19–21.)

The Committee on Screw Threads, Bolt Heads and Nuts recommended the standard proposed in an essay on a system of screw threads and nuts by Mr. William Sellers of Philadelphia, and reported by a special committee appointed by the Franklin Institute of Philadelphia. The following was adopted (page 21):

"*Resolved*, That the Master Car-Builders' Association have the proposed system printed on cards and presented to car-masters and car manufacturing companies, requesting them to use their influence to promote the adoption of a uniform system of screw-threads, bolt-heads and nuts." (See also the reports of 1879 and 1882.)

The accompanying table is reprinted from the essay of William Sellers referred to above.

HEIGHT OF DRAW-BARS.
(Pages 42, 43, 46.)

"Mr. VARNEY: I move that this Association adopt two feet and eight inches (2 ft. 8 in.) as the height of draw-bars on freight cars, from the top of rail to the centre of the draw-head.

"Mr. MYERS: I offer as an amendment that the height be two feet and eleven inches (2 ft. 11 in.).

"On vote the amendment of Mr. Myers was lost.

"Mr. VARNEY: I would ask permission to withdraw my motion. Permission was granted.

"Mr. VARNEY: I now move that two feet and nine inches (2 ft. 9 in.) be accepted as the height of draw-bars on freight cars from the top of track to the centre of the draw head.

"J. N. KING: I move, as an amendment, that the height be made two feet and ten inches (2 ft. 10 in.). This was not seconded.

"Mr. FORD: I move, as an amendment, that the height of draw-bars from the top of rail to the centre of draw-head be two feet and nine inches (2 ft. 9 in.) for all cars, passenger and freight.

"A vote was then taken on Mr. Myers'* amendment, with the following result: Fifty-three (53) for and nine (9) against the proposed height of draw-bar."

SIXTH ANNUAL CONVENTION.

At the sixth annual convention, held in St. Louis in 1872, the following action was taken:

SHOULDER ON AXLES.
(Page 22.)

"*Resolved*, That it is the opinion of this convention that the shoulder hitherto used upon car-wheel axles for the purpose of staying the wheel at a certain place be abandoned, as it is a detriment, and no benefit."

SEVENTH ANNUAL CONVENTION.

At the seventh annual convention, held in Boston in 1873, the following resolutions were adopted:

PATENTEES AND SUPPLY AGENTS.
(Page 75.)

"*Resolved*, That no patentee or supply agent shall be allowed to exhibit or discuss his wares in the hall during the sessions of the convention."

OBJECTS OF THE ASSOCIATION.
(Page 76.)

"*Whereas*, It is thought that an impression prevails among the managers of some railroads, that the action of this Association is intended to be enforced by its members without the advice and consent of their superior officers, therefore

"*Resolved*, That it is the sense of this meeting that the resolutions of the Master Car-Builders in convention assembled are intended merely as recommendations, made as an association, to the managers of railroads for their adoption or rejection, as they may deem expedient."

STANDARD AXLE
(Pages 105 and 106.)

"Mr. M. C. ANDREWS moved that this Association adopt as a standard size of journal, 3¾ by 7 in., which motion was agreed to without a count.

"Mr. L. GAREY moved that the length be 6 ft. 10 in. between the collars.

"This was carried.

"Mr. H. O. WADLIE moved to increase the diameter of the axle ¼ in. at the wheel-seat, the space between the wheel-seat and journal, and at the collar.

"The motion was put and carried."

(See also reports of 1876, 1878 and 1879.)

(Engravings of this axle were published in the *Railroad Gazette* of Sept. 6, 1873; Feb. 21, 1874; April 17, 1875; Oct. 2, 1875; Oct. 17, 1879; and July 1, 1881.)

STANDARD JOURNAL-BEARING, JOURNAL-BOX AND PEDESTAL.
(Page 109.)

"Mr. ADAMS moved that the matter be referred to a committee, with power to produce a box, according to their own judgment, that shall be considered the standard box.

"This resolution was amended by Mr. FORNEY so as to make the Committee to consist of five members, and was then adopted as amended."

In accordance with this action the following Committee was afterwards appointed:

C. A. Smith, J. W. VanHouten, Joseph Jones, David Hoit, F. D. Adams.

EIGHTH ANNUAL CONVENTION.

At the eighth annual convention, held in Cincinnati in 1874, the following resolutions were adopted:

STANDARD JOURNAL-BEARING, JOURNAL-BOX AND PEDESTAL.

"The CHAIR called for the report of the Committee on Oil-Box and Journal-Bearing Patterns.

"Mr. L. GAREY: That Committee was appointed with power to perfect this matter, and I think it is essential that they should report what has been done.

"Mr. SMITH: We have brought on a number of lithographs for distribution. Here is the report of the Committee in this lithographed drawing."

These lithographs were printed by J. Bien on sheets 20¾ by 30 in. and were distributed among the members during the meeting and afterwards. (See also report of 1880.)

CHECK-CHAINS.
(Pages 57 and 72.)

"*Resolved*, That truck and car-body check-chains are, when properly applied, a valuable acquisition on passenger equipment, and your Committee recommend their general use."

NINTH ANNUAL CONVENTION.

At the ninth annual convention held in New York in 1875, the following are the resolutions adopted:

ENTERTAINMENTS.
(Page 163.)

"*Whereas*, The practice of entertaining the members of this Association by its friends has become an established custom, and has thus assumed somewhat the character of an obligation to which those who have so generously dispensed hospitality have, in a measure, felt themselves obliged to conform; and,

"*Whereas*, The expenditure of time and money for this purpose has in many cases been very much greater than the members of this Association have the right to expect should be devoted to their enjoyment; and,

"*Whereas*, The expense of such hospitality has in some cases been interpreted as having a significance which has been the cause of embarrassment to members:

"*Therefore*, We desire by this resolution, first, to express our thanks for the liberality of our friends in the past; and secondly, to make the request in this public way, that in the future there shall be no more expenditure of money for the public entertainment of members of this Association."

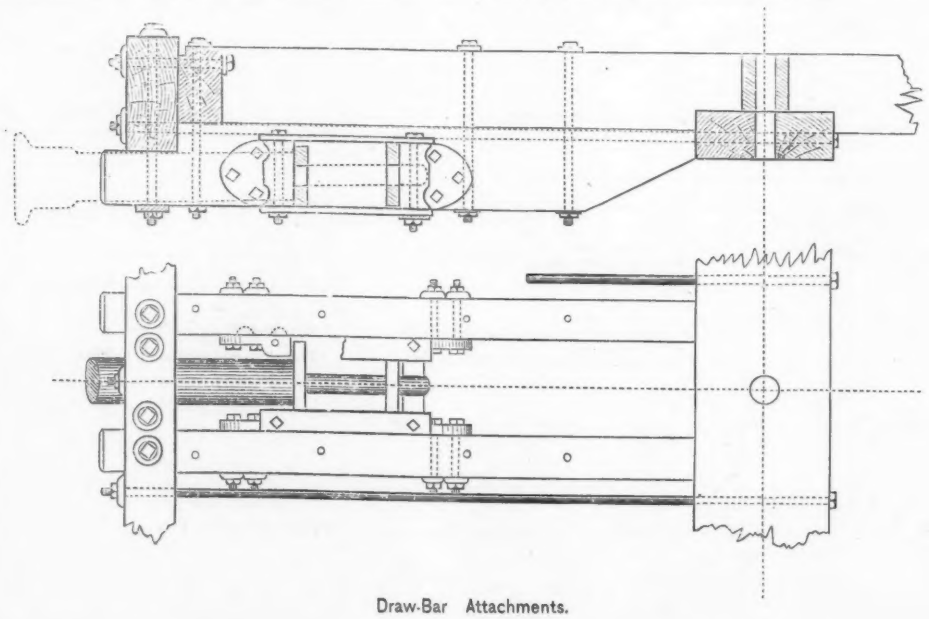
The preamble and resolution were unanimously adopted.

TENTH ANNUAL CONVENTION.

At the tenth annual convention, held in New York in 1876, action was taken on various subjects as follows:

ATTACHMENTS OF DRAW-BARS.
(Pages 65 and 70).

"*Resolved*, That it is the opinion of this Association that all attachments of draw-bars at their rear end should be in accordance with the general plan that has been shown by the Committee on Draw-bars and Buffers; and we discountenance all future application of such attachments below the timber under the car-bodies, alluded to in the report of said Committee."



Draw-Bar Attachments.

With the understanding that the object of the resolution was merely recommendatory, and not as authorizing a refusal to receive cars not built in accordance therewith, the above resolution was adopted. The following engraving is a copy of the "general plan" referred to in the above resolution.

STANDARD AXLE.
(Page 99).

Mr. VAN HOUTEN offered a resolution, proposing to receive the action of the Association at its annual meeting held in Boston, in June, 1873, fixing upon the dimensions of a standard axle, and that the subject be referred to a committee of three, whose duty it shall be to report to the next annual meeting.

"The Committee asked for was appointed, consisting of J. W. Van Houten, W. E. Chamberlain and D. Hoit." (See also reports of 1873, 1878 and 1879.)

TWELFTH ANNUAL CONVENTION.

The following is the only action noted as taken in the twelfth annual convention, held at Niagara Falls in 1878:

STANDARD AXLE
(Page 129.)

"Mr. J. W. HOLMES: I move that the Committee on this subject be continued, and instructed to confer with the Master Mechanics' Committee.

"The motion was carried." (See also reports of 1873 and 1879.)

THIRTEENTH ANNUAL CONVENTION

Action on various matters was taken as follows at the thirteenth annual convention, held in Chicago in 1879:

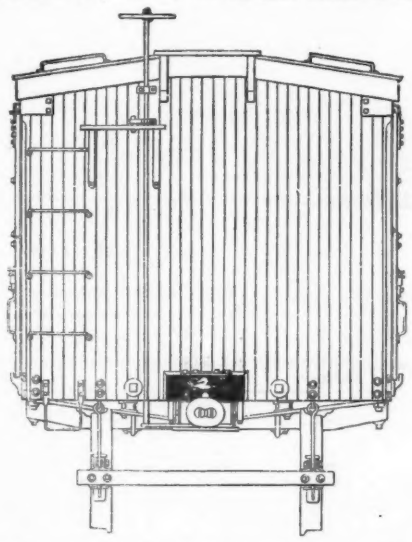
SCREW THREADS AND NUTS.
(Pages 82 and 83.)

"*Resolved*, That this Association will in future adopt the Sellers threads and sizes of nuts, as recommended by the Franklin Institute, and that in giving any future orders for bolt iron or nuts they will require the sizes to strictly conform with the above standard.

"We also emphatically submit this resolution to the earnest attention of all car manufacturers, and urge them to adopt the same standard sizes in all cases within their control." (See also reports of 1872 and 1882).

POSITION OF BRAKE SHAFTS.
(Page 85.)

"*Resolved*, That this Association recommend that all brake-shafts be placed on the left-hand corner of the car



when a person is standing on the track facing the end of the car."

DRAW-BARS.
(Pages 96 and 98.)

"On motion, the recommendation of the committee that the length for a standard draw-bar from end of head to the first follower-plate be 28 in. was adopted.

"On motion of Mr. ORTTON, the depth was made 6 in. at outer yoke in carrying plate.

"Mr. CAMPBELL: I move that the width for draw-bar at carrying plate or yoke be 6 in. Adopted.

"It was then moved and adopted that the follower-plates be wrought iron, 1½ in. thick, 6 in. wide and 8¾ in. long, rectangular in form.

"Mr. CAMPBELL: I move that the size of the house be 11 in. long and 6¼ in. wide. Carried.

"MR. W. B. SNOW: I move that the pin-hole in draw-bar be made so as to take a 2 by 1½ in. pin, and be 4 in. from face of draw-bar. Adopted.

"*Resolved*, That when a strap is used on back end of draw-bar, it shall have a clear space of 11 in. long and 6¼ in. wide. When a spindle is used it shall be 2 in. diameter, 17 in. long from under side of head to outer edge of key; key to be 2½ in. wide and ¼ in. thick."

DRAW-SPRINGS.
(Page 100.)

"MR. L. GAREY moved that the capacity of draw and buffer springs should be not less than 13,000 lbs. Adopted."

CONTINUOUS DRAW-BARS.
(Page 101.)

"*Resolved*, That when the continuous draw-bar is used

* This is evidently an error in the original report. It should be Mr. Ford's amendment and not Mr. Myers'. The standard height adopted was 2 ft. 9 in.

PROPORTIONS FOR SELLERS' STANDARD SCREW-THREADS, NUTS AND BOLTS.

Screw-Threads.				Nuts.				Bolt Heads.			
Diameter of screw.	Threads per inch.	Diameter at root of thread.	Width of flat.	Short diameter rough.	Short diameter finish.	Thickness rough.	Thickness finish.	Short diameter rough.	Short diameter finish.	Thickness rough.	Thickness finish.
1/4	20	.185	.0062	7/16	7/16	1/4	3/16	7/16	7/16	1/4	3/16
5/16	18	.240	.0074	17/32	17/32	5/16	1/4	17/32	17/32	5/16	1/4
3/8	16	.294	.0078	5/8	5/8	3/8	5/16	5/8	5/8	3/8	5/16
7/16	14	.344	.0089	23/32	23/32	7/16	3/8	23/32	23/32	7/16	3/8
1/2	13	.400	.0096	13/16	13/16	1/2	7/16	13/16	13/16	1/2	7/16
9/16	12	.454	.0104	29/32	29/32	9/16	1/2	29/32	29/32	9/16	1/2
5/8	11	.507	.0113	1 1/16	1	5/8	9/16	1 1/16	1	5/8	9/16
3/4	10	.620	.0125	1 1/4	1 1/16	3/4	5/8	1 1/4	1 1/16	3/4	5/8
7/8	9	.731	.0138	1 7/16	1 1/8	7/8	3/4	1 7/16	1 1/8	7/8	3/4
1	8	.837	.0156	1 5/8	1 5/16	1	15/16	1 5/8	1 5/16	1	15/16
1 1/8	7	.940	.0178	1 13/16	1 1/4	1 1/8	1 1/16	1 13/16	1 1/4	1 1/8	1 1/16
1 1/4	7	1.065	.0178	2	1 7/16	1 1/4	1 1/16	2	1 7/16	1 1/4	1 1/16
1 3/8	6	1.160	.0208	2 3/16	2 1/16	1 3/8	1 5/16	2 3/16	1 5/8	1 3/8	1 5/16
1 1/2	6	1.284	.0208	2 5/16	2 3/16	1 1/2	1 7/16	2 5/16	2 1/16	1 1/2	1 7/16
1 5/8	6 1/2	1.389	.0227	2 9/16	2 5/16	1 5/8	1 9/16	2 9/16	2 1/16	1 5/8	1 9/16
1 3/4	5	1.491	.0250	2 3/4	2 1/16	1 3/4	1 11/16	2 3/4	2 5/16	1 3/4	1 11/16
1 7/8	5	1.616	.0250	2 15/16	2 3/4	1 7/8	1 13/16	2 15/16	2 5/8	1 7/8	1 13/16
2	4 1/2	1.712	.0277	3 1/8	3 1/16	2	1 15/16	3 1/8	3 1/16	1 15/16	1 15/16

Rough Nut = one and one half diameter of bolt + 1/8.

Finished Nut = one and one-half diameter of bolt + 1/16.

Rough Nut = diameter of bolt.

Finished Nut = diameter of bolt − 1/16.

Rough Head = one and one-half diameter of bolt + 1/8.

Finished head = one and one-half diameter of bolt + 1/16.

Rough head = one-half distance between parallel sides of head.

Finished head = diameter of bolt − 1/16.

the length and size of draw-bar shall be the same as that adopted."

STANDARD AXLES.
(Page 103.)

"MR. ORTTON: I move that this Association re-affirm its action of 1873, in recommending a standard form and proportion for car axles.

"MR. FORNEY: I offer this amendment: With such modifications as the two committees may recommend, provided the dimensions of the finished part of the axle be not altered. The motion as amended was adopted." (See also reports of 1873, 1876 and 1878.)

PROTECTION OF TRAINMEN FROM ACCIDENTS.

The following recommendations were adopted:

Height of Draw-bars and Position of Coupling-pins (pages 108 and 109).—"That special pains be taken to have the draw-bars in all freight equipment made 2 ft. 9 in. from top of rail to centre of mouth of the draw-bars; and that the draw-bars be so placed in the cars as to locate the coupling-pins not less than five inches from the centre to the face of the dead-woods."

Dead-woods (pages 108 and 109).—"That the double dead-woods be discontinued from all freight cars and a solid block 6 in. thick, placed directly over the draw-bar, be used in their place." (See also report of 1882.)

Steps (pages 108 and 110).—"That two good substantial steps, made of wrought iron ⅛ by 1¾ in., be fastened, one to each side-sill, at diagonal corners of the car."

Ladders and Handles (Pages 109, 110 and 111).—"That each box and stock car have two ladders, not less than five steps in each ladder, made of ⅝-in. round iron, projecting 3½ in. from the siding, securely fastened to each end at diagonal corners, with a handle directly over the ladders, on the roof.

"Mr. C. E. GAREY moved that the lower steps of the ladder have a guard or projection in order to prevent men slipping when swinging around the end of the car to get on the step.

"The recommendation as amended was adopted."

Brake-steps or Platforms and Fastening of Brake Ratchet-wheel and Pawl (pages 109 and 113).—"That the small platform placed at one end of freight cars, to fasten the brake-pawl, etc., be discontinued, the ratchet-wheel and pawl to be fastened to a suitable casting on the roof."

Running-Boards (Pages 109 and 114).—"That the running-boards be not less than 18 in. wide and 1 in. thick, the ends of which to project 5½ in. outside of the boarding, the projections to be supported by two braces made of 1¼ in. by 1¼ in. iron."

FOURTEENTH ANNUAL CONVENTION.

At the fourteenth annual convention, held in Detroit in 1880, the following were the resolutions adopted:

DICTIONARY OF TERMS.
(Pages 11 to 20.)

"The Committee to whom was assigned the duty of preparing a Dictionary of Terms used in the construction of cars, reported that they had finished their work and were discharged." (See also report of 1872.)

GAUGE OF WHEELS.
(Page 148.)

"Mr. DAVENPORT moved that in the judgment of this Association three-quarters of an inch clearance has been demonstrated to be the most economical in operating on the 4 ft. 8½ in. gauge. Agreed to."

FIFTEENTH ANNUAL CONVENTION.

At the fifteenth annual convention, held in New York in 1881, the following action was taken:

JOURNAL-BEARINGS, JOURNAL-BOXES AND PEDESTALS.

"*Resolved*, That the drawings* of the car-journal bearing, journal-box and pedestal, of which copies are submitted herewith, be declared to represent the standard form and proportions for those parts, and that the same be approved by this Association for general use on cars and locomotive tenders;

"*Provided*, That this resolution shall be so construed as to cover the proportions and weights of the general parts involved, only so far as the same may be necessary for free interchangeability; and further, that this recommendation shall not be construed to include any particular form of box-cover." (See also report of 1874.)

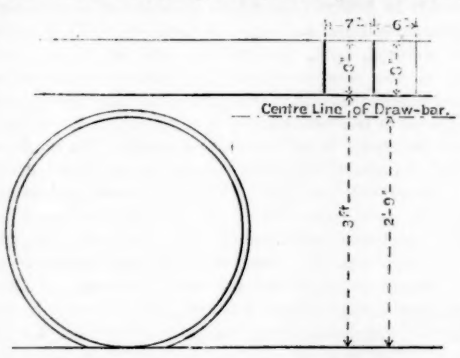
*These drawings were published in the *Railroad Gazette* of July 1, 1881.

SIXTEENTH ANNUAL CONVENTION.

The following standards were recommended at this convention, held in Philadelphia in 1882:

DEAD BLOCKS.
(Pages 45 and 77.)

* * "We would therefore recommend that when double dead-blocks are made, they be made 8 in. square on the face,



Standard Single and Double
Dead Blocks
Recommended at the Convention
of the Master Car-Builders Association
in Philadelphia, June 1882

and 6 in. thick, and placed 22 in. apart, centre to centre, giving a clear space between them of 14 in.

"Those whose preferences are for single dead-blocks must make them not less than 28 in. long, 7 in. thick and 8 in. face."

On motion of Mr. C. E. Garey, the height from the rail to the bottom of the block was fixed at 3 ft.

Mr. Raymond moved (page 77) "that the distance between the two dead-blocks be 12 in.," which was adopted. (See also report of 1879).

The following engraving represents the standard, as agreed upon, for single and double dead-blocks:

INITIALS OF ROADS ON CARS.
(Page 158.)

Mr. LEANDER GAREY: "I move that the Secretary be instructed to write to all parties who have cars the initials of which are the same, requesting them to stencil the name of the road upon some part of the car that can be readily seen by freight agents." Agreed to.

DIAMETER OF CHILL-MOLDS FOR CAR WHEELS.
(Pages 178 and 179.)

Mr. FORNEY: "I would move that the standard diameter of chill-molds for 33 in. wheels be 33⅛ in. at the point indicated in the engraving." Agreed to.

Mr. FORNEY: "I move that the standard diameter of chill-molds for 30 in. wheels be 30⅝ in. at the point indicated in the engraving." Agreed to.

WIDTH OF WHEEL TREAD.
(Page 179.)

Mr. C. E. GAREY: "I renew my motion, that the distance over all be 5½ in. from outside of tread to inside of flange." Agreed to.

WHEEL GAUGES.
(Page 197).

"*Resolved*, that the sense of this meeting is that all the gauges recommended by the Committee on Wheel Gauge should be in use in all repair and car-building shops of every equipment, except the limit gauge referred back to the Committee."

(These gauges were illustrated in the *Railroad Gazette* of June 23, 1882.)

SCREW THREADS.
(Page 223.)

"*Resolved*, That this Association deprecates the use of screws larger or smaller in diameter by a small fraction of an inch than the sizes specified for the Sellers or Franklin Institute system; and that all its members are urged to abandon entirely the use of over or under size screws." (See also reports of 1872 and 1879).

STANDARD SCREW GAUGES AND TWO-FOOT RULE.
(Page 229.)

The Committee was instructed to procure a set of the unhardened gauges manufactured by the Pratt & Whitney Company, these to be kept among the archives of the Association as the standard of measurement of screw-threads, and for ultimate reference in case of need. The Committee was also instructed to get a standard two-foot rule.

RULES GOVERNING THE CONDITION OF AND REPAIRS TO FREIGHT CARS FOR THE INTERCHANGE OF TRAFFIC.

A code of rules for this purpose has been adopted by the Association and has been revised at each annual meeting. The changes made at the last meeting were very slight. A copy of them is appended to the annual report of the year.

Cussing the President.

When Gen. Mahone was President of the Atlantic, Mississippi & Ohio road, one of the engineers had a fireman put on him that he did not like, so he resolved to get rid of him. One day, just after the first trip, the fireman and the engineer were discussing Gen. Mahone, and the fireman remarked that he felt like giving the General a good cussing.

"Why don't you do it, then?" remarked the engineer.

"Yes, and get fired," sententiously said the fireman.

"Not much," replied the engineer. "You can never get along on this road until you cuss Mahone. I cussed him once for every blankety blank thing that has happened since he was in charge, and have got along all right."

The fireman concluded he would do the same thing. So the next trip to Richmond he went to Mahone's office and heaped on him such a torrent of abuse that nearly took his breath away. Mahone heard him through, and then told the fireman to come and get his money after his next trip. There semed to be a hitch somewhere. Things seemed to be different from what he expected, so he went to consult his friend, the engineer.

"You darn fool," shouted the latter, "you didn't cuss him to his face, did you?"

"Of course I did," the fireman said. "Didn't you tell me that you did the same thing?"

"No, not by a blamed sight," adding some words that contained a not very complimentary allusion to the heated flames of the lower regions. "Why, when I cussed Mahone, he was in Richmond and I was in Bristol, and I gave him a good cussing, too."

Well, the fireman got bounced and the engineer was made suddenly and strangely happy.—*Nashville (Tenn.) American*

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which lwil be published*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

FREIGHT-CAR COUPLINGS.

There is no task which the re-organized Car-Builders' Association can undertake more profitably than to improve the draw-gear and couplings of freight cars. The records of train accidents show that the breaking apart of freight trains is one of the most prolific causes of accidents, and probably only a very small proportion of those which occur are reported or find their way into the newspapers.

If the reason for the failure of couplings is asked for, the answer is a very simple one: It is because the couplings and draw-gear are not strong enough. It is strange how long it takes the average man to learn the obvious lesson that when things break it is because they are too weak. He will attribute the failure to every conceivable cause, and adopt all kinds of remedies to obviate the defect before he will adopt the plain one of adding to the strength of the structure. A rather amusing case of this kind occurred some years ago in one of the locomotive shops of the country, which will not be mentioned. The proprietor was a very worthy man in every way, and had the respect of all who knew him, but his knowledge of the principles of the strength of materials was somewhat limited. In designing his engines he calculated the strength of the driving spring-hangers on the assumption that good iron would break at a tensile strain of 60,000 lbs. per square inch. He therefore inferred that if they were not subjected to that degree of tension they would not break. He consequently took the weight of the engines and found how much of it each hanger had to carry, and then proportioned them so that the strain was somewhat less than 60,000 lbs. per square inch. As a consequence they were constantly breaking while the engines were in service, and trains were often delayed from that cause. Our practical friend would attribute it to all kinds of causes—to the want of flexibility in the springs, or elasticity in the connections, poor quality in the iron, etc., etc., until finally some of the younger men about the works assumed the authority of making the section of metal two or three times as great as the calculation of their senior indicated was necessary, which cured the defect. The average man reasoned the same way about rails ten or more years ago. Then breakages of rails were much more frequent than they are now. The weight per yard of the rails that were then generally used was much less than at present. Increased weight and strength, with improved quality, has reduced the breakages immensely. About the same time that there were so many breakages of rails, locomotive boilers persisted in blowing up. These explosions were attributed to the influence of electricity, dissociation of gases, percussive action of the water, and to almost every cause excepting the true one, which was that the strength of the shell outside was not sufficient to resist the pressure inside. Thicker plates were finally adopted, and, as a consequence, for some years there have been comparatively few explosions of locomotives. With the increase of pressure now introduced, and without any corresponding addition to the strength of the boilers, it is probable, though, that we may soon expect a new crop of explosions.

With car axles there was the same experience, and the old members of the Car-Builders' Association will recall the fierce way in which the adoption of the standard axle was resisted because it was considered too big. Now the general lament is that it is not big enough.

Car couplings and draw-gear seem, just now, to be in that period of development when their failure is attributed to inscrutable causes, instead of to their own inherent weakness. The scrap heap of every railroad repair shop contains scores of broken coupling links, draw-bars are constantly giving out, and their attachments are torn from the cars. That a very thorough reform is needed there can be little doubt. But how can it be brought about?

It is obvious that it cannot be done by a resolution of the Car-Builders' Association alone, unless such action simply confirms some carefully matured design of draw-gear which is the result of thorough and intelligent investigation. It is the exercise of intelligence and the evolution of knowledge which must precede the action of the Association, and by which alone the best plan of draw-gear can be determined. It is true that through the Association the experience of its members may be compared and, as it were, concentrated, but the work of designing any complicated structure must be the work of one or a few minds.

Thus, let us take the simple case of coupling links. There can be no doubt that most of those now used are too weak to resist the strains to which they are subjected in the long and heavy trains which are now the rule, and not the exception, on many roads. If we examine a pile of broken links we shall find that the great majority of them have failed at the ends or in the bend, showing that they are too weak at that point. Generally, coupling-links are made of a round bar of iron bent into the proper shape and welded up. There is then as much metal in the straight portion as there is at the bend, and quite naturally they break at the latter place. In some other kinds of construction, notably in bridges, the whole question of the relative strength of links and eyes has been very thoroughly investigated, both theoretically and by experiment, and it has been as clearly established as any fact in mechanics can be that there must be very much more material in the bent part of a link than in the straight part to make it of uniform strength. Until quite lately coupling-links have been made in entire disregard of this principle. Within a few years several patents have been taken out for improvements in links, and the processes for their manufacture, and now they can be ordered with any amount of additional strength in the bent portion. Unfortunately though there is a practical difficulty in the way of increasing their size beyond certain dimensions. The pins as well as the links have been too weak, and therefore it has been found necessary to make the opening in the links wide enough to admit a pin of somewhat larger dimensions than those ordinarily used. If, when this is done, the amount of metal at the bend of the links is made larger, it is found that the openings in many of the draw-bars in use are too small to admit the enlarged links, so that they are limited in size by this fact.

It is true, also, that a link made of poor material will not stand as much strain as one made of good iron. Of course the material should be of such quality as would best resist the severest strains to which links are subjected. Now, it has often been hastily assumed that, because the purpose of the coupling-links is to unite the cars, and thus draw them in trains, therefore the greatest strain which they must resist is one of tension, and consequently, in some cases, they have been tested in a machine in which they have been subjected to a gradual pull by hydraulic or other power. Any one who will notice a heavy freight train started in a difficult place will be convinced at once that the severest strain which coupling-links must resist is more of the nature of a blow or concussion than of gradual extension. Now, the manner of testing links is important for the reason that iron which will resist a very high gradual tension may be very weak if subjected to a sudden blow. Therefore to determine whether a coupling-link has the requisite qualities it should be tested by a sudden blow in the direction in which it must resist such strains, when a locomotive runner is "taking up the slack" of a long and heavy train. Fortunately the appliances for doing this are very simple, and can be provided at any car shop and at very little cost. All that is required is a suitable weight, or "drop," and proper supports, so that the link can be suspended from its upper end and the blow of the drop be transmitted to the lower end.

Supposing now that a committee was appointed to recommend a standard coupling-link, what would be the process of evolving the best standard?

Evidently the first step would be to find out the strength or the weakness of the links which are now in use. To do this, suitable apparatus should be erected at some shops, and specimens, taken from different roads, ought to be tested in the manner described, and a careful determination should be made to show how much of the weakness is due to poor material and how much to bad proportions. When satisfactory material has been obtained, experiment would soon show which part of the link was weakest, and would indicate where it should be strengthened. By gradually increasing the strength at the weak points, and testing the links which are thus strengthened, a committee or an investigator could thus evolve a link of uniform strength in every part, and could then learn how much one of that kind would resist, if made of as good iron as it would be commercially permissible to use. The committee would then be in a position to propose a standard form and proportions for links and a specification of the tests to which they should be subjected. Such an investigation might indicate that some modification of the openings in draw-bars is essential in order to be able to increase the size of the link and its strength to what is required.

The same method of investigation could be adopted in designing a standard draw-gear, although, of course, that would be a more complicated matter. It would be easy to make a model of full size, of a draw-bar and its attachments which could be placed under a drop and tested in the same way as that described for testing links, and after plans had been perfected in this way it would probably be a profitable expenditure of money to test the perfected apparatus under the same circumstances as those which exist in practice; that is, attach it to a car and expose it to a collision or a sudden pull analogous to that which the draw-gear must resist when a locomotive is taking up the slack. It would be easy to graduate the concussion of a collision by placing the car to be tested at the foot of a grade, and then taking another up the incline and letting it run down from a given point, so as to come into collision with the one at the foot.

Preliminary to making any designs of draw-gear, a very careful comparison ought to be made of all the systems in use, at least on the principal lines. From these a skillful constructor could evolve a design which probably would have very decided merit; but the good and the weak points should, of course, be demonstrated by experiment.

It may be considered absurd to propose to smash a car in order to find out where its weak points are, but when it is remembered there are over 700,000 cars now in use in this country, and that the number is rapidly increasing, and that the defects of their draw-gear is causing many accidents, it will be seen that any plan which will indicate how this enormous equipment may be improved would have immense value to railroad companies.

One of the most entertaining experiments that could be made would be to take one of the New York & New Haven Railroad cars, like the one which was smashed up in the tunnel the other day, and place it at the foot of a grade, as described, and then let a car, properly framed, loose on the incline, so as to run into the one at the foot. Such an experiment would probably result in the old cars being speedily withdrawn from service. To make it entirely satisfactory, though, the Superintendent and board of directors ought to occupy the car while the experiment was being made. There is no prospect, though, that such an investigation will be undertaken, but the demand in the Car-Builder's Association for an improvement of the draw-gear of freight cars is imperative. If the task of recommending a standard is undertaken, it cannot be satisfactorily done by simply taking a vote or securing "an expression of opinion."

In this, as in a great many other cases, it is more important that means should be adopted of forming opinions which are worth expression than that those which members have on hand should be made public. The value of a standard will be determined by the knowledge, the skill, the experience and the ingenuity, perhaps, which are exercised in devising it. A majority vote will only sanction what must be evolved by the exercise of superior intelligence.

RAILROAD EARNINGS IN AUGUST.

For the month of August our table of earnings has reports from 69 railroads, which this year worked 51,746 miles of road, which is 5,529 miles (12 per cent.) more than they were working in August last year, and about 49 per cent. of the total in the country. With this mileage their aggregate earnings were $34,250,874, or $3,593,023 (11.7 per cent.) more than last year, and their average earnings per mile *decreased* from $663 to $662.

Of the 69 roads reporting for August only 16 had smaller total earnings this year than last, but as many as 29 had smaller earnings per mile. Seven had decreases and ten had increases in earnings per mile amounting to more than 20 per cent. The largest increases were 163 per cent. by the Ohio Central, 57¾ by the Manitoba, 51¾ by the Evansville & Terre Haute, 41½ by the St. Paul & Duluth, 36 by the Belleville Line of the St. Louis & Terre Haute, 35 by the Hocking Valley, 34 by the Northern Central and 30¾ by the St. Louis & San Francisco.

The largest decreases in earnings per mile were 41 per cent. by the Des Moines & Fort Dodge, 26¾ by the Iowa lines of the Illinois Central, 25 by the Central Branch, 24 by the Central Iowa, 23 by the Milwaukee & St. Paul, 21 by the Little Rock & Fort Smith and the Chicago & Northwestern, and 20¾ by the Denver & Rio Grande.

August for the country south of the latitude of Ft. Wayne, Peoria and the south line of Iowa is a month when much winter wheat may be marketed, and in the whole corn country usually much corn is then marketed, though less than in July, as in August farmers are more engaged in harvesting. This year there was little corn left to market in August, and the consequence was that the roads north of the winter wheat country had little grain traffic of any kind in August, and usually much less than last year, when they had corn to carry. Further south the roads had much more wheat this year, but much less corn. This may explain some of the reports which otherwise might seem strange. So far as the carriage of farm produce is concerned, August must have been an exceptionally bad month for such roads as the Northwestern, the St. Paul, the Iowa lines of the Illinois Central, the St. Paul & Omaha, the Des Moines & Fort Dodge, the Burlington, Cedar Rapids & Northern, the Central Iowa, and the Central Branch.

The aggregate mileage and earnings of these roads compare as follows:

	1882.	1881.	Inc. or Dec.	P.c.
Miles	10,481	9,190	I. 1,291	14.0
Earnings	$4,627,175	$5,022,840	D. $395,665	7.9
Earnings per mile	$441	$547	D. $106	19.4

In spite of an increase of 14 per cent. in mileage the aggregate earnings of these roads *decreased* nearly 8 per cent., and their average earnings per mile fell off 19½ per cent.

Let us now turn to the roads further south which this year in August were able to carry a good share of the new winter wheat crop, in which we include the Wabash, the Scioto Valley, the Louisville, New Albany & Chicago, the two Terre Haute lines, the Evansville & Terre Haute, the Peoria, Decatur & Evansville, the Indiana, Bloomington & Western, the Illinois Central in Illinois, the Chicago & Alton, the Hannibal & St. Joseph, the Missouri Pacific, the St. Louis & San Francisco, and the Atchison, Topeka & Santa Fe. The aggregate mileage and earnings of these 13 roads were:

	1882.	1881.	Inc. or Dec.	P.c.
Miles	9,780	8,362	I. 1,418	19.0
Earnings	$6,514,250	$5,897,503	I. $616,747	10.4
Earnings per mile	$666	$705	D. $39	5.5

The earnings of this group have not kept pace with the mileage, it is true; but there has been a large increase in the aggregate earnings, and but a small decrease in the earnings per mile of road.

The Southern roads are unusually well represented for August, there being reports from no less than 18 of them. The small grains had all been harvested before August on these roads, and the crop had been unusually good; but grain there is not marketed to any considerable extent, and the great export crop of the country, cotton, does not begin to come forward till September, and the movement of the old crop in August was exceptionally light this year. The certainty of good crops is what stimulated traffic in the South last August, not the marketing of them. But this had a very great effect, not seen so much in an increase of earnings over last year, as in the cessation of the unfavorable comparisons which have been the rule in previous months. The aggregates of the 18 Southern roads were:

	1882.	1881.	Increase.	P.c.
Miles	11,262	10,209	1,053	10.3
Earnings	$5,306,489	$4,726,087	$580,393	12.3
Earnings per mile	471	463	8	1.7

Only four of the 18 roads had a decrease in earnings, and these decreases were small. When the cotton begins to move freely we may expect a greater improvement on these roads.

There are but six roads east of Ohio and north of the Potomac that report, but among these are the great Pennsylvania and the Reading. The aggregate mileage and earnings of these six roads have been:

	1882.	1881.	Increase.	P. c.
Miles	4,194	4,099	95	2.3
Earnings	$8,106,245	$7,038,695	$1,127,550	16.0
Earnings per mile.	1,923	1,715	208	12.1

These roads, with less than half the mileage of either the other three groups, had much greater earnings. These are roads in the great industrial centre of the country, and one of them is the throat through which passes more or less of the traffic of most other roads in the country. These alone show a large increase in earnings per mile, which are nearly three times as great as those of any other group. No inconsiderable part of the increase, doubtless, was due to the higher rates this year in place of the war rates of last year. Nearly a third of the aggregate increase of earnings of the entire 69 roads was made by these six, though their increase in length was but 95 miles, against 5,434 by the other 69 roads.

If we take all the 63 roads reporting except this little Eastern group, we shall find:

	1882.	1881.	Inc. or Dec.	P. c.
Miles	47,552	42,118	I. 5,434	12.9
Earnings	$26,084,629	$23,619,156	I $2,465,473	10.4
Earnings per mile.	548	561	D. 13	2.3

Thus we may say generally that in August the decided gains were in the East and South. The roads of all the rest of the country (including the two groups first named and all the roads not classed) made the following showing:

	1882.	1881.	Inc. or Dec.	P. c.
Miles	36,290	31,909	I. 4,381	13.7
Earnings	$20,778,149	$18,893,069	I. $1,885,080	10.0
Earnings per mile.	572	592	D. 20	3.4

These earnings would be satisfactory but for the increase in mileage, which makes probable a larger proportion of expenses to earnings. To support the additional 4,381 miles of road there is $1,885,080 of gross earnings, or $430 per mile. A great many roads live on less than this, however, and, so long as the country is growing fast, a railroad company may well afford to have a considerable mileage of non-paying new road. If the new mileage were evenly distributed among all the roads there would be scarcely any danger that it would become burdensome; but some companies have such an enormous amount of it that it is of prime importance to them that the country on them be settled and yield traffic enough to support them at the earliest possible moment.

The largest and smallest earnings per mile in August were:

Largest:	Per mile.	*Smallest:*	Per mile.
Pennsylvania	$2,340	Green Bay, W. & St P.	$139
Marquette & Ontonagon	2,080	Toledo, Cin. & St. L.	185
Northern Central	2,047	Wisconsin Central	185
Reading	1,988	Vicksburg & Meridian	192
Hocking Valley	983	Little Rock & Ft. Smith	203
Missouri Pacific	972	St. Louis & Cairo	223
Chicago & Alton	945	Central Branch	241
Iron Mountain	901	Ohio Southern	243
N. Y. & New England	893	Mil., Lake Shore & W	244
Long Island	891	Ala. Great Southern	255

Three other roads, the Mobile & Ohio, the Cleveland, Akron & Columbus, and the Peoria, Decatur & Evansville, earned less than $300 per mile. No others earned as much as $800.

Below we give our usual table of earnings per mile for six successive years:

August Earnings per Mile of Road for Six Years.

	1877.	1878.	1879.	1880.	1881.	1882.
Ala., Gt. Southern	....	....	$120	$302	$235	$255
Atchison, Top. & S. F.	$348	$504	527	488	589	667
Burl., C. R. & Nor.	275	241	283	326	371	363
Central Iowa	337	292	....	419	521	395
Central Pacific	725	821	664	805	753	773
Chesapeake & Ohio	....	....	496	596	604	718
Chicago & Alton	725	831	695	906	926	945
Chic. & E. Ill.	420	542	473	509	711	723
Chic., Mil. & St. Paul	479	357	336	319	442	355
Chic. & N. W.	605	603	579	685	801	632
Chic., St. P., Minn. & Om.	....	....	324	314	393	376
Cin., N. O. & Tex. Pac.	....	....	....	443	678	680
Cleve., Akron & Col.	216	219	187	244	253	296
Col., Hocking V. & Tol.	599	500	650	709	728	983
Denver & Rio Grande	284	358	274	777	648	514
Des Moines & Ft. Dodge	....	....	347	337	613	362
Det., Lansing & Nor.	....	....	567	473	583	594
E. Tenn., Va. & Ga.	....	315	....	244	282	311
Flint & Pere Marquette	....	....	316	410	495	481
Hannibal & St. Joseph	622	733	485	815	720	886
Ill. Cen., in Ill.	704	701	579	648	732	730
Ill. Cen., in Iowa	317	256	267	343	488	358
Ind., Bloom. & Wes.	208	586	507	550	490	401
Int. & Gt. Northern	225	224	233	274	407	346
Lake Erie & Western	....	....	223	353	433	439
Louisville & Nashville	482	441	401	481	476	509
Mo., Kan. & Tex.	411	375	389	376	513	508
Mobile & Ohio	239	227	210	278	318	206
Nash., Chat. & St. L.	445	372	407	372	456	456
N. Y. & New Eng.	....	....	....	791	788	893
Norfolk & Western	430	362	315	421	458	519
Northern Central	1,139	993	971	1,392	1,528	2,047
Northern Pacific	....	....	328	309	576	560
Pennsylvania	1,563	1,664	1,563	1,989	1,975	2,359
Peoria, Dec. & Ev.	....	....	....	238	348	288
Phila. & Reading	1,502	1,523	1,579	1,811	2,013	1,988
Richmond & Danville	276	286	304	339	389	391
St. L., A. & T. H.:						
Main line	....	....	542	773	644	766
Belleville line	655	623	616	546	526	716
St. Louis & Cairo	119	143	180	272	237	223
St. Louis & San Fran.	377	368	404	452	443	578
St. L., Iron Mt. & So.	547	509	589	826	941	901
St. P., Minn. & Man.	....	....	339	355	479	756
Scioto Valley	....	291	292	324	416	464
Texas & Pacific	330	373	416	430	434	417
Toledo, Cin. & St. L.	....	....	....	109	181	185
Union Pacific	....	....	....	626	765	739
Wabash, St. L. & Pac.	....	....	....	615	622	529
West Jersey	730	677	624	....	1,071	1,222

Of the roads reporting, the following had larger earnings per mile in August in previous years than in 1882:

23 out of 49 in 1881.
10 out of 48 in 1880.
1 out of 40 in 1879.
3 out of 33 in 1878.
3 out of 31 in 1877.

Thus 1881 seems to have been the best of the previous years, and then, in fact, our table last year showed an increase of about 7 per cent. in the average earnings per mile of 59 railroads over 1880, and the 1880 table showed an increase of 12 per cent. over 1879. August last year made a more favorable comparison with 1880 than any other month of the year except June.

For the eight months ending with August our table has reports from 62 railroads which this year worked 50,633 miles of road, which is 5,622 miles, or 12¼ per cent., more than they worked last year. With this mileage they earned $234,689,249, which is $26,492,155 (12.7 per cent.) more than last year; and their average earnings per mile *increased* from $4,625 to $4,635, or 0.2 per cent., which is precisely the increase made by the 50 roads reporting last year over 1880. In 1880 there was an increase of 14.7 per cent. over 1879. Only nine of the 62 roads reporting this year had a decrease in total earnings, but 21 had a decrease in earnings per mile. Nine roads had an increase in earnings per mile of more than 20 per cent.; the very large ones are 39¼ per cent. by the Chicago & Grand Trunk, 48 by the Marquette, Houghton & Ontonagon, 37½ by the Milwaukee, Lake Shore & Western, 56½ by the Ohio Central, 41 by the St. Paul & Duluth, 56½ by the Manitoba, and 33¾ by the Wisconsin Central.

Only three roads have a decrease of as much as 20 per cent. in earnings per mile—the Central Branch 32 per cent., the Denver & Rio Grande 25¾, and the Mobile & Ohio 21.

The largest and smallest earnings per mile for the eight months are:

Largest:	Per mile.	*Smallest:*	Per mile.
Pennsylvania	$16,204	Toledo, Cin. & St. L.	$1,387
Reading	13,636	Central Branch	1,401
Northern Central	11,745	St. Louis & Cairo	1,621
Marquette & Ontonagon	9,785	Ala. Gt. Southern	1,715
Iron Mountain	6,001	Mil., Lake Shore & W.	2,602

The Pennsylvania's earnings per mile are 3½ times the average, the Ontonagon's twice as great, and the Iron Mountain's nearly a third more than the average. On the other hand, two of the roads have not one third of the average earnings per mile.

On the whole, it may be said that at the end of August the gross earnings of the roads reporting, which include nearly half the mileage of the country, were substantially the same per mile as last year. The roads reporting probably did better on the average than those not reporting, which include all the trunk lines except the Pennsylvania, and nearly all the New England roads, and some of the most important Western lines.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Central Pacific.—This company's *Northern* line is extended from Corning, Col., north to Tehama, 7 miles.

Chicago & Atlantic.—Track is laid from Kenton, O., west 15 miles; from Crown Point, Ind., east 44 miles; from Huntington, Ind., east 35 miles and west 30 miles, making 124 miles in all.

Chicago & Northwestern.—The *James River Branch* is extended from Ordway, Dak., northeast to Columbia, 6 miles.

Galveston, Harrisburg & San Antonio.—Completed to a point twenty miles westward from Devil's River, Tex., an extension of 32 miles.

Humeston & Shenandoah.—Completed by laying track from Grand River, west to Clarinda, 62 miles.

Jersey Shore, Pine Creek & Buffalo.—Track laid from Stokesdale, Pa., southward 8 miles.

Minnesota Central.—Track laid from Waterville, Minn., east by north to Faribault, 17 miles.

Southern Pacific.—The *Mohave Branch* is extended eastward to Calico, Cal., 28 miles.

Wisconsin Central.—On this company's *Milwaukee Extension* track is laid from Schliesingerville, Wis., north 10 miles, and from Oshkosh south 10 miles.

This is a total of 304 miles of new railroad, making 7,589 miles thus far this year, against 5,034 miles reported at the corresponding time in 1881, 3,938 miles in 1880, 2,328 miles in 1879, 1,420 miles in 1878, 1,505 miles in 1877, 1,719 miles in 1876, 861 miles in 1875, 1,125 miles in 1874, 2,867 miles in 1873 and 5,066 miles in 1872.

THROUGH TRAFFIC WEST OF CHICAGO is now pretty well pooled. The Iowa Trunk Lines Association, including the roads between Chicago and Council Bluffs, is one of the oldest of combinations of this kind, and perhaps more completely and uniformly successful than any other. The Chicago, Milwaukee & St. Paul is now a member, and receives an equal share (one-fourth) of the freight business not being ready yet to put on passenger trains to make as good time as the older roads; but in a few weeks it will doubtless receive its share of the passenger business. On the new road which is to complete the Wabash's line

between Chicago and Council Bluffs the track is just laid, and in a few weeks doubtless it will be prepared to do business. Its line will be about 560 miles long—60 miles longer than the longest and 70 miles longer than the shortest of the other lines. To secure an equal share of the passenger traffic it will have to put on a pretty fast train, but it will doubtless go into the pool on nearly, if not quite, equal terms with the other four roads. Thus the valuable Chicago-Council Bluffs traffic, hitherto divided among three railroads, will have to be divided among five hereafter. This association has recently been put in charge of Mr. J. W. Midgley, Commissioner of the Southwestern Association, and Mr. George H. Daniels, late Commissioner of the Iowa Association, becomes Assistant Commissioner of the two. The Iowa Association never had any Commissioner or other officer until a few months ago.

The Colorado Association seems now likely to be in full force again, the Chicago, Burlington & Quincy and the Union Pacific coming to an agreement about Denver and other Colorado business. This Association also has Mr. Midgley as Commissioner.

The latest of the associations are the Northwestern Association, covering the traffic of St. Paul and Minneapolis, the Central Iowa Association, which deals with the traffic of Des Moines and vicinity, and the Rock Island-Davenport-Moline Association. These three were organized at the same time to settle the differences between the Northwestern, the Milwaukee & St. Paul and the Rock Island roads. The traffic in these associations is not divided, and the object of the Association is to see that rates are maintained, penalties being imposed for any violation. Mr. George L. Carman, who has charge of the joint line of the Burlington and the Wabash between Humeston and Shenandoah, is made Commissioner of these three associations.

Measures have been taken, as we have noted, for the division of the traffic between Chicago and St. Louis, so that from Chicago to all leading competing points northwest, west and southwest the railroads are co-operating in order to maintain uniform and paying rates.

CHICAGO RAIL SHIPMENTS EASTWARD for the third week of September we reported last week; for the fourth week (nine days) we shall not be able to give them until next week. The shipments billed at Chicago, excluding those from points west billed through Chicago, were 23,457 tons in the week ending September 30, this year, against 27,187 tons in the preceding week this year and 45,336 tons in the corresponding week of 1881. It should be remembered that these shipments do not always fluctuate with the total shipments; but the corner which greatly stimulated receipts at Chicago in the last week of September tended to prevent shipments: wheat was worth more there than in New York. Of the total shipments this year 11,626 tons (49.5 per cent.) were grain, 5,599 tons (23.9 per cent.) flour, and 6,232 tons (26.6 per cent.) were provisions; last year 30,603 tons (67.4 per cent.) were grain, 6,923 tons (15.3 per cent.) flour, and 8,810 tons (17.3 per cent.) were provisions. Thus of the total decrease of 21,879 tons, 18,977 tons were grain. Meanwhile the lake shipments of grain increased from 33,743 tons last year to 51,863 this year, and yet were decidedly light this year.

The apportionment of the Chicago traffic has been under consideration by the Arbitrator, to whom appeal was made, since July, but the parties were so late in making their arguments that full information is not yet before him, and it will doubtless be some time yet before the award is made.

The close of the corner, which restricted wheat shipments in September, may be expected to cause a good deal of accumulated grain to come forward; but having once gone into the elevators it is more likely to be shipped by lake than by rail. On the other hand the great fall in the price of wheat from the end of one month to the beginning of another may cause the farmers to hold back their grain and so make October receipts less than they would have been otherwise.

THE CHICAGO LUMBER TRAFFIC has been large this year, and larger than was to be expected after the bad crops of last year; but in midsummer, after a large crop of small grain was assured, and when, therefore, we might have expected an increase in the demand for lumber, it was on the contrary rather lighter. In August the shipments and sales at Chicago amounted to about 186,522,000 ft., which is 16,735,000 ft. (8¼ per cent.) less than last year. But in September there was a renewal in the demand, and the shipments and sales, as nearly as can now be estimated, were 196,827,000 ft., which is 41,689,000 ft., (27 per cent.) *more* than last year.

Though the Chicago shipments are still of great importance, as indicating the purchasing power of the country supplied by that city, which is an immense territory, they do not measure the lumber consumption of the whole West as they formerly did; and especially they do not indicate the growth by immigration; for the reason that the country which is now growing fastest does not get its supplies from Chicago, but directly from the Wisconsin and Minnesota mills, this country being Western Minnesota, Dakota and Manitoba.

CANAL RATES have fallen off during the past week about ¾ cent a bushel, and on Wednesday were 3 7-8 cents a bushel for oats, 5¼ for corn and 5¾ for wheat, from Buffalo to New York.

Lake rates are unchanged, at 2¼ cents for corn, and 2½ for wheat, from Chicago or Milwaukee to Buffalo, with light shipments, and these nearly all taken by steamers. There is little change in ocean rates, quotations being 3⅛d. to 4d. a bushel for grain from New York by steamer to Liverpool.

RAILROAD EARNINGS IN AUGUST.

NAME OF ROAD.	MILEAGE. 1882.	1881.	Inc.	Dec	P.c.	EARNINGS. 1882.	1881.	Increase.	Decrease.	P. c.	EARNINGS PER MILE. 1882.	1881.	Inc.	Dec.	P. c.
						$	$	$	$		$	$	$	$	
Ala. Gt. Southern	290	290	.....	.....	.....	73,794	68,187	5,607	.....	8.2	255	235	20	.....	8.2
Atchison, Top. & S. F.	1,832	1,670	162	.....	9.7	1,221,945	1,000,640	221,305	.....	22.0	667	599	68	.. ..	11.3
Buffalo, Pitts. & West	223	205	18	.....	8.8	91,422	72,009	19,413	.....	27.0	410	351	59	.....	16.8
Bur., Ced. Rap. & No.	620	564	56	.....	9.9	224,920	209,111	15,809	.....	7.6	363	371	.....	8	2.2
Central Iowa	244	190	54	.....	28.4	97,550	98,936	.....	1,386	1.4	395	521	.....	126	24.2
Central Pacific	3,040	2,775	265	.....	9.5	2,227,000	2,088,519	138,481	.....	6.6	733	753	.....	20	2.7
Ches. & Ohio	517	435	82	.....	18.9	371,185	262,858	108,327	.....	41.2	718	604	114	.....	18.8
Chicago & Alton	847	840	7	.....	0.8	800,624	769,751	30,873	.....	4.0	945	916	29	.....	3.2
Chi. & Eastern Ill.	232	220	12	.....	5.5	167,027	156,497	11,130	.....	7.1	723	711	12	.....	1.7
Chi., Mil. & St. Paul.	4,350	3,800	550	.....	14.5	1,545,000	1,678,361	.....	133,361	7.9	355	442	...	87	23.3
Chi. & Northwestern.	3,320	2,890	430	.....	14.9	2,039,754	2,315,164	.....	215,410	9.3	632	801	.....	169	21.0
Chi., St. P., M. & O.	1,050	960	90	.....	9.4	394,555	376,897	17,658	.....	4.7	376	393	.....	17	4.3
Chi. & West Mich.	336	320	16	.....	5.0	125,672	120,292	5,380	.....	4.5	366	376	.....	10	2.6
Cin., N. O. & T. Pac.	336	336	.....	.....	.....	228,419	227,740	679	.....	0.3	680	678	2	.....	0.3
Cleve., Akron & Col.	144	144	.....	.....	.....	42,687	36,394	6,293	.....	17.4	296	253	43	.....	17.4
Col., Hock'g V. & Tol.	320	320	.....	.....	.....	314,512	233,089	81,423	.....	34.9	983	728	255	.....	34.9
Denver & R. G.	1,116	935	181	.....	19.4	574,040	606,193	.....	32,153	5.3	514	648	.....	134	20.7
Des M. & Ft. Dodge	108	84	24	.....	28.6	28,242	51,450	.....	23,208	45.1	362	613	..	251	40.9
Det., Lan. & Nor.	226	226	..	.....	.....	134,211	131,686	2,525	.....	1.9	594	583	11	.....	1.9
E. Tenn., Va. & Ga.*	900	900	.....	.....	.....	279,977	254,312	25,665	.....	10.1	311	282	29	.....	10.0
Evansv. & T. H.*	157	144	13	.....	9.0	95,218	57,581	37,637	.....	64.8	607	400	207	.....	51.7
Flint & Pere Mar.	345	318	27	.....	8.5	166,057	157,366	8,691	.....	5.5	481	495	.....	14	2.8
Gal., Har. & San A.*	270	256	14	.....	5.5	150,000	112,000	38,000	.....	33.9	556	438	118	... ..	27.3
G'n B., Win. & St. P.*	220	220	.....	.....	.....	30,696	32,452	.....	1,756	5.4	139	148	.....	9	.....
Gulf, Col. & S. F.	392	260	132	.....	50.8	138,791	100,720	38,062	.....	37.7	354	387	.....	33	8.5
Hannibal & St. Jo.	292	292	.....	.....	.....	258,628	210,240	48,388	.....	23.0	886	720	166	.....	23.0
Ill. Cen., Ill. lines	918	918	.....	.....	.....	669,839	672,036	.....	2,197	0.3	730	732	.....	2	0.3
Iowa lines	402	402	.....	.....	.....	143,761	196,371	.....	52,610	26.8	358	488	.....	130	26.8
Ind., Bloom. & West.	695	555	140	.....	25.2	278,814	272,114	6,700	.....	2.5	401	490	.....	89	18.2
Lake Erie & Western.	388	388	.....	.....	.....	169,715	167,164	2,551	.....	1.5	439	433	6	.....	1.5
Little Rock & Ft. S.*	168	168	.....	.....	.....	34,028	43,121	.....	9,093	21.0	203	257	.....	54	21.0
Long Island	335	335	.....	.....	.....	298,013	274,650	23,983	.....	8.7	891	820	71	... ..	8.7
Louisville & Nash.	2,025	1,840	185	.....	10.1	1,030,385	876,193	154,192	.....	17.8	509	476	33	.....	6.9
Louisv., N. A. & Chi.*	380	290	90	.....	31.0	141,000	97,750	43,250	.....	44.1	371	337	34	.....	10.1
Mar., Hought. & Ont.	88	88	.....	.....	.....	183,000	155,000	28,000	.....	18.0	2,080	1,761	319	.....	18.0
Mil., L. S. & West.	296	250	46	.....	18.4	73,085	59,443	13,642	.....	23.1	244	238	6	.....	2.5
Mo. Pacific lines:															
Central Branch	387	300	87	.....	29.0	93,390	96,547	.....	3,157	3.3	241	322	.....	81	25.0
Int. & Gt. Northern.	775	623	152	.....	24.4	268,386	253,502	14,884	.....	5.1	346	407	.....	61	15.0
Mo., Kan. & Tex.	1,230	1,003	227	.....	22.5	625,423	514,165	111,258	.....	21.6	508	513	...	5	0.9
Mo. Pacific.	935	800	135	.....	16.9	908,737	659,464	249,273	.....	37.8	972	824	148	.....	18.2
St. L., I. M. & So.	750	685	65	.....	9.5	675,980	644,385	31,595	.....	4.9	901	941	...	40	4.3
Texas & Pacific.	1,054	880	174	.....	19.8	439,917	381,331	58,586	.....	15.4	417	434	.....	17	4.0
Mobile & Ohio	538	506	32	.....	4.3	140,443	160,789	.....	20,346	12.6	260	318	.....	52	16.5
Nash., Chat. & St.L.†	348	348	...	.....	.....	168,304	168,317	.....	13	...	456	456	...	...	...
N. Y. & N. England.	396	356	40	.....	11.2	353,726	280,524	73,202	.....	26.1	893	788	105	... ..	13.3
Norfolk & Western.	428	428	.....	.....	.....	222,161	196,123	26,038	.....	13.3	519	458	61	... ..	13.3
Northern Central.	326	326	.....	.....	.....	667,488	498,008	169,480	.....	34.0	2,047	1,528	519	.....	34.0
Northern Pacific.	1,298	754	544	.....	72.5	727,377	434,085	293,292	.....	67.6	560	576	...	16	2.8
Ohio Central.	232	232	.....	.....	.....	184,195	70,014	114,181	.....	163.1	794	302	492	.....	163.1
Ohio Southern*.	138	128	10	.....	7.8	33,482	24,501	8,981	.....	36.0	243	191	52	.....	27.3
Pennsylvania‡	1,980	1,925	55	.....	2.8	4,671,179	3,809,978	861,201	.....	22.6	2,359	1,975	384	.....	19.4
Peo., Dec. & Evansv.	254	248	6	.....	2.4	75,724	86,250	.....	10,526	12.2	298	348	...	50	14.3
Phila. & Reading	994	994	.....	.....	.....	1,975,993	2,000,987	.....	24,994	1.2	1,988	2,013	.....	25	1.2
Rich. & Danville	757	757	.....	.....	.....	296,034	294,837	1,197	.....	0.4	391	389	2	.....	0.4
St. L., A. & T. H., M. Li'e	195	195	.....	.....	.....	149,457	125,592	23,865	.....	19.0	766	644	122	.....	19.0
Belleville Line	121	121	.....	.....	.....	86,080	63,588	23,092	.....	36.2	716	526	190	... ..	36.2
St. Louis & Cairo.	146	146	.....	.....	.....	32,558	34,677	.....	2,119	6.1	223	237	.....	14	6.1
St. Louis & San Fran.	620	645	15	.....	2.4	381,037	286 373	95,264	.....	33.3	578	443	135	... ..	30.7
St Paul & Duluth.	175	175	.....	.....	.....	103,364	73,002	30,362	.....	41.6	591	417	174	.....	41.6
St. P., Minn. & Man.	1,060	862	194	.....	22.4	801,779	414,954	386,825	.....	93.2	756	479	277	.....	57.7
Scioto Valley	128	128	.....	.....	.....	59,361	53,286	6,075	.....	11.4	464	416	50	.....	11.4
Tol., Cin. & St. L.	484	435	49	.....	12.2	89,368	78,627	10,741	.....	13.6	185	181	4	.....	2.2
Union Pacific.	3,740	3,450	290	.....	8.4	2,762,107	2,638,659	123,448	.....	4.7	739	765	.....	26	3.4
Utah Central*	280	280	.....	.....	.....	120,877	102,316	18,561	.....	18.1	432	365	67	.....	18.1
Vicks. & Meridian*	142	142	.....	.....	.....	27,200	32,664	.....	5,464	16.7	192	230	..	38	16.7
Va. Midland	352	352	.....	.....	.....	136,053	134,834	1,219	.....	0.9	386	383	3	.....	0 9
Wab., St. L. & Pacific.	3,350	2,480	870	.....	35.1	1,772,542	1,542,838	229,704	.....	15.0	529	622	.....	93	14.9
West Jersey	163	163	.....	.....	.....	199,246	174,548	24,698	.....	14.7	1,222	1,071	151	.....	14.7
Wisconsin Central	520	520	.....	.....	.....	95,940	85,790	10,150	.....	11.8	185	165	20	.....	11.8
Total, 69 roads	51,746	46,217	5,529	.....	.....	34,250,874	30,657,851	4,130,816	537,793	.....	662	663	.....	1	.....
Total inc. or dec	.....	.....	5,529	.....	12.0	.....	.....	3,593,023	.....	11.7	.....	.....	.....	1	0.2

* Roads marked thus are not in the table of earnings for the seven months. ‡ Includes all lines east of Pittsburgh and Erie.
† Does not include branch or leased lines.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Evansville & Terre Haute, annual meeting, at the office in Evansville, Ind., Oct. 16, at 11 a. m.

Ohio & Mississippi, annual meeting, at the office in Cincinnati, Oct. 12, at 10 a. m.

Hannibal & St. Joseph, annual meeting, at the office in Hannibal, Mo., Nov. 6, at 10 a. m. Transfer books close Oct. 2.

East Tennessee, Virginia & Georgia, annual meeting, at the office in Knoxville, Tenn., Nov. 8. Transfer books close Oct. 14.

Western Maryland, annual meeting, at Hillen station in Baltimore, Oct. 18.

Massachusetts Central, annual meeting, at the Lowell station in Boston, Oct. 25, at noon.

Railroad Conventions.

The *Master Car-Builders' Association* will meet in convention, pursuant to adjournment, on Oct. 10, at Niagara Falls.

The Southern Railway Time Convention will meet at No. 46 Bond street in New York, Oct. 18.

The *Association of American Railroad Superintendents* will hold its fourth meeting at No. 46 Bond street, New York, Oct. 18, beginning at 10 a. m.

The *Brotherhood of Locomotive Engineers* will hold its annual convention in Louisville, Ky., beginning Oct. 18.

The *Southern Railway & Steamship Association* will hold its eighth annual convention in Atlanta, Ga., Oct. 25.

The *American Society of Mechanical Engineers* will hold its stated annual meeting in New York, Nov. 2. Arrangements for the meeting will be announced hereafter.

Dividends.

Dividends have been declared as follows:

Cincinnati, Indianapolis, St. Louis & Chicago, 1½ per cent., quarterly, payable Oct. 15.

Delaware, Lackawanna & Western, 2 per cent., quarterly, payable Oct. 20. Transfer books close Oct. 4.

Housatonic, 2 per cent., quarterly, on the preferred stock, payable Oct. 16.

Pittsburgh, Ft. Wayne & Chicago (leased to Pennsylvania company), 1¾ per cent., quarterly, payable on special stock Oct. 2, on regular stock Oct. 3.

Vermont & Massachusetts (leased to Fitchburg company), 3 per cent., semi-annual, payable Oct. 7.

Sioux City & Pacific, 3½ per cent., semi-annual, on preferred stock, payable Oct. 4.

Nashua & Rochester (leased to Worcester & Nashua), 1½ per cent., semi-annual, payable Oct. 2.

Boston, Clinton, Fitchburg & New Bedford (leased to Old Colony), 3½ per cent, semi-annual, on preferred stock, payable Oct. 16.

Southern Railway & Steamship Association.

Notice is given that the eighth annual convention of the Southern Railway & Steamship Association will be held at the Kimball House, Atlanta, Ga., on Wednesday, Oct. 25, 1882.

All transportation companies, members of or working with the Association, are requested to send duly authorized representatives.

Directors and committees from stockholders of companies members of the Association are, under the rules, invited to attend.

The convention will be called to order at 3 o'clock p. m.

Southern Railway and Steamship Association—Managers' Meeting.

A meeting was held in Atlanta, Ga., Sept 13, on call of the General Commissioner. The following representatives were present:

Central, of Georgia, W. G. Raoul, G. A. Whitehead.
Richmond & Danville and leased lines, T. M. R. Talcott, Sol. Haas, J. H. Drake, G. S. Barnum.
South Carolina Railroad, John B. Peck.
Georgia Railroad, J. W. Green, E. R. Dorsey.
Western, of Alabama, Cecil Gabbett.
Atlanta & West Point, Cecil Gabbett, A. J. Orme.
Rome Railroad, Eben Hillyer.
Augusta & Knoxville, E. F. Verdery.
East Tennessee, Virginia & Georgia, W. V. McCracken, D. A. Beattie, J. R. Ogden, George R. Knox, Ray Knight.
Western & Atlantic, R. A. Anderson, Joseph M. Brown.
Cincinnati, New Orleans & Texas Pacific, E. P. Wilson.
Nashville, Chattanooga & St. Louis, George R. Knox, W. McPherson.
Charleston & Savannah, S. C. Boyleston.
Louisville & Nashville, Theodore Welch.
Port Royal & Augusta, J. S. Davant.
Associated Railroads of Virginia and the Carolinas, R. D. Carpenter.
Charlotte, Columbia & Augusta, D. Cardwell.
Memphis & Charleston, J. S. Davant.
Green Line, T. E. Walker.
Savannah Line, D. W. Appler.

The General Commissioner stated the object of the meeting to be the division of Chattanooga business, and the re-division of Augusta, Athens, Macon, Atlanta and Rome.

Mr. Ogden offered the following, which was adopted:

"*Resolved*, That the Chairman appoint a committee for each point, to be divided, to make said divisions, and that said committee consist of one representative from each initial road at each point."

The Chairman appointed the committees as follows:

For Chattanooga, Messrs. Ogden, Anderson, Wilson and Knox.
For Augusta, Messrs. Peck, Raoul, Haas, Verdery and J. S. Davant.
For Athens, Ga., Messrs. Haas and Green.
For Macon, Messrs. Raoul, Green and Ogden.
For Rome, Ga., Messrs. Hillyer and Ogden.

RAILROAD EARNINGS, EIGHT MONTHS ENDING AUGUST 31.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1882.	1881.	Inc.	Dec	P. c.	1882.	1881.	Increase.	Dec.	P. c.	1882.	1881.	Inc.	Dec.	P. c.
Ala. Gt. Southern	290	290	.....	.....	.....	$ 497,381	$ 473,017	$ 261,364	$	5.1	$ 1,715	$ 1,631	$ 84	.....	5.1
Atchison, Top. & S. F.	1,808	1,633	170	.....	10.3	9,109,663	7,403,479	1,706,184	.....	23.4	5,039	4,520	519	.....	11.5
Buffalo, Pitts. & West.	212	205	7	.....	3.4	557,302	425,815	131,487	.....	30.9	2,629	2,077	552	.....	26.3
Bur., Cedar Rap. & No.	620	564	56	.....	9.9	1 714,594	1,380,494	334,100	.....	24.2	2,765	2,448	317	.....	12.9
Central Iowa	244	190	54	.....	28.4	735,308	578,104	157,204	.....	27.2	3,014	3,043	.....	29	0.9
Central Pacific	2,946	2,631	315	.....	12.0	16,412,866	14,877,789	1,535,077	.....	10.4	5,571	5,655	.....	84	1.5
Ches. & Ohio	480	435	45	.....	10.3	2,087,080	1,784,077	303,003	.....	17.0	4,348	4,101	247	.....	6.0
Chi. & Alton	847	840	7	.....	0.8	4,906,276	4,691,914	214,362	.....	4.7	5,792	5,584	208	.....	3.7
Chi. & Eastern Ill.	232	220	12	.....	5.5	1,132,876	1,042,093	90,783	.....	8.7	4,883	4,737	146	.....	3.1
Chi. & Gd. Trunk*	335	335	.....	.....	.....	1,339,783	960,226	379,557	.....	39.5	3,999	2,866	1133	.....	39.5
Chi., Mil. & St. Paul	4,243	3,797	446	.....	11.7	12,150,000	10,365,868	1,784,132	.....	17.2	2,864	2,730	134	.....	4.9
Chi. & Northwestern	3,289	2,806	483	.....	17.3	14,740,738	13,340.919	1,399,819	.....	10.5	4,482	4,754	.....	272	5.7
Chi., St. P., Minn. & O.	1,039	951	88	.....	9.3	2,983,033	2,444,026	539,007	.....	22.0	2,871	2,570	301	.....	11.7
Chi. & West Mich	324	320	4	.....	1.3	957,260	836,786	120,474	.....	14.4	3,955	2,615	340	.....	13.1
Cin., N. O. & Tex. Pac	336	336	.....	.....	.....	1,607,974	1,422,146	185,828	.....	13.1	4,786	4,233	553	.....	13 1
Cleve., Akron & Col	144	144	.....	.....	.....	317.604	269,516	48,088	.....	17.8	2,206	1,872	334	.....	17.8
Col., Hock'g Vy. & Tol.	320	320	.....	.....	.....	1,803,744	1,463,385	340,359	.....	23.3	5,636	4,573	1063	.....	23.3
Denver & Rio Grande	1,070	699	371	.....	53.0	4,221,470	3,710,234	511,236	.....	13.8	3,945	5,308	.....	1363	25.7
Des M. & Ft. Dodge	87	84	3	.....	3.6	223,868	243,402	.....	19,534	8.0	2,573	2,898	.....	325	11.2
Det. Lan. & No	226	226	.....	.....	.....	1,034,122	880,204	153,918	.....	17.5	4,576	3,895	681	.....	17.5
Flint & Pere Marq	345	318	27	.....	8.5	1,365,162	1,198,554	166,608	.....	13.9	3,957	3,769	188	.....	5.0
Grand Trunk†	2,322	2,213	109	.....	4.9	10,600,040	10,612.015	.....	11,975	0.1	4,565	4,795	.....	230	4.8
Gulf, Col. & S. F.	343	225	118	.....	52 8	720,711	541,077	179,634	.....	33.2	2,101	2,405	.....	304	12.6
Hannibal & St. Jo.	292	292	.....	.....	.....	1,340,010	1,420,272	.....	80,262	5.6	4,589	4,864	.....	275	5.6
Ill. Cent., Ill. lines	918	918	.....	.....	.....	4,491,647	4,285,729	205,918	.....	4.8	4,893	4,669	224	.....	4.8
Iowa lines	402	402	.....	.....	.....	1,182,959	1,155,890	27,069	.....	2.3	2,943	2,875	68	.....	2.3
Ind., Bloom. & West.	590	555	35	.....	6.3	1,637,321	1,617,887	19,434	.....	1.2	2,775	2,915	.....	140	4.8
Lake Erie & Western	386	386	.....	.....	.....	933,361	917,212	16,149	.....	1.7	2,418	2,376	42	.....	1.7
Long Island	335	322	13	.....	4.0	1,532,811	1,319.575	213,236	.....	16.2	4,576	4,098	478	.....	11.7
Louisville & Nashv.	2,025	1,840	185	.....	10.1	8,191,284	7,170,844	1,020,449	.....	14.2	4,045	3,897	148	.....	3 8
Mar., Hought. & Ont.	88	88	.....	.....	.....	861,113	581,989	279,124	.....	48.0	9,785	6,614	3171	.....	48.0
Mil., Lake Sh. & West.	282	250	32	.....	12.8	564,623	364,008	200,615	.....	55.1	2,002	1,456	546	.....	37.5
Mo. Pacific lines:															
Central Branch	381	300	81	.....	27.0	533,662	638,649	.....	104,987	16.6	1,401	2,129	.....	728	34.2
Int. & Gt. No.	775	623	152	.....	24.4	1,808,100	1,593,327	214,773	.....	13.5	2,333	2,557	.....	224	8.8
Mo., Kan. & Tex.	1,215	903	312	.....	34.7	3,755,084	3,293,984	461,100	.....	13.9	3,091	3,648	.....	557	15.3
Mo. Pacific	884	750	134	.....	17.9	4,858,324	4,261,307	597,017	.....	14.0	5,496	5,682	.....	186	3.3
St. L., Iron Mt. & So.	737	685	52	.....	7.6	4,422,802	4,513,326	.....	90,524	2.0	6,001	6,587	.....	586	8.9
Texas & Pacific	989	775	214	.....	27.6	2,869,956	2,441,840	428,116	.....	17.1	2,902	3,151	.....	249	7.8
Mobile & Ohio	528	506	22	.....	4.3	1,164,568	1,414.236	.....	249,668	17.6	2,208	2,795	.....	587	21.0
Nash., Chatta. & St. L‡	348	348	.....	.....	.....	1,216,040	1,397,972	.....	181,932	13.0	3,494	4,017	.....	523	13.0
N. Y. & New England	396	321	75	.....	23.4	2,202,295	1,768,342	433,953	.....	24.6	5,561	5,509	52	.....	0.9
Norfolk & Western	428	428	.....	.....	.....	1,438,655	1,364,627	74,028	.....	5.4	3,361	3,188	173	.....	5.4
Northern Central	326	326	.....	.....	.....	3,828,842	3,600,688	228,154	.....	6.3	11,745	11045	700	.....	6.3
Northern Pacific	1,120	737	383	.....	51.5	4,065,933	2,126,579	1,939,354	.....	90.7	3,630	2,885	745	.....	25.7
Ohio Central	232	232	.....	.....	.....	625,753	400,031	225,722	.....	56.4	2,697	1,724	973	.....	56.4
Pennsylvania§	1,935	1,894	41	.....	2.2	31,471,178	29,144,235	2,326,943	.....	7.9	16,264	15388	876	.....	5.7
Peoria, Dec. & Evans.	254	227	27	.....	11.7	516,022	430,576	85,446	.....	19.8	2,032	1,897	135	.....	7.1
Phila. & Reading	994	994	.....	.....	.....	13,553,949	12,973,801	580,148	.....	4.5	13,636	13052	584	.....	4.5
Rich. & Danville	757	757	.....	.....	.....	2,203,050	2,124,893	78,157	.....	3.7	2,910	2,807	103	.....	3.7
St. L., Alt. & T. H., Main Line	195	195	.....	.....	.....	852,024	960,681	.....	108,657	11.3	4,369	4,927	.....	558	11.3
Belleville Line	121	121	.....	.....	.....	543,431	478,518	64,913	.....	13.6	4,491	3,955	436	.....	13.6
St. L. & Cairo	146	146	.....	.....	.....	239,716	274,611	.....	37,895	13.7	1,621	1,881	.....	260	13.7
St. L. & San Francisco.	660	598	62	.....	10.3	2,214,099	2,000,377	213,722	.....	10.6	3,255	3,345	10	.....	0.3
St. P. & Duluth	175	175	.....	.....	.....	620,715	440,016	180,699	.....	41.1	3,547	2,514	1033	.....	41.1
St. P., Minn. & Manitoba	947	770	177	.....	23.0	5,286,089	2,750,722	2,535,367	.....	92.2	5,582	3,572	2010	.....	56.3
Scioto Valley	128	112	16	.....	14.3	338,975	257,322	81,653	.....	51.4	2,648	2,298	350	.....	15.2
Tol., Cin. & St. L.	432	341	91	.....	26 7	599,175	420,332	178,843	.....	42.6	1,387	1,233	154	.....	12.5
Union Pacific	3,725	3,415	310	.....	9.1	18,162,107	16,128,659	2,033,448	.....	12.6	4,876	4,723	153	.....	3.2
Va. Midland	352	352	.....	.....	.....	862,886	804,615	58,271	.....	7.2	2,451	2,286	165	.....	7.2
Wab., St. L. & Pac.	3,350	2,480	870	.....	35.1	10,602,629	8,901,855	1,700,774	.....	19.1	3,165	3,589	.....	424	11.8
West Jersey	163	140	23	.....	16.4	778,902	686,945	91,957	.....	13.4	4,778	4,907	.....	129	2.6
Wisconsin Central	520	520	.....	.....	.....	1,103,304	825,482	277,822	.....	33.7	2,122	1,587	535	.....	33.7
Total, 62 roads	50,633	45,011	5,622	.....	.....	234,683,249	208,197,094	27,377,589	885,434	.....	4,635	4,625	10	.....	.....
Total inc. or dec.	.....	.....	5,622	.....	12.5	.....	.....	26,492,155	.....	12.7	.....	.....	10	.....	0.2

* Roads marked thus are not in the table for August.
† Not in August table; includes former Great Western road.
‡ Does not include branch or leased lines.
§ Includes all lines east of Pittsburgh and Erie.

For Atlanta, Messrs. Anderson, Green, Raoul, Gabbett, Ogden and Haas.

The following, offered by Capt. Raoul, were, after discussion, adopted:

"*Whereas*, There appears no reasonable probability of the committees appointed to make redivisions at Rome, Chattanooga, Atlanta, Athens and Macon, of cotton and merchandise, agreeing among themselves; and whereas, it is believed that after much time has been occupied in discussions the matter will at last have to be decided by disinterested parties. Therefore

"*Resolved*, That the division of business at the above named points, between the several lines interested be and the same is hereby submitted to the General Commissioner, under the rules of the Southern Railway & Steamship Association, which gives the right of appeal to the Board of Arbitrators.

"*Resolved*, That whatever divisions may be ultimately arrived at must take effect from the first day of September.

"*Resolved*, That all lines expecting to share in the division must report business and make deposits to the General Commissioner from Sept. 1."

The following, offered by Capt. Raoul, were adopted:

"*Resolved*, That it is understood by this meeting that notice of the approval or disapproval of General Managers John Scott and Henry Fink, concerning the submission of divisions to arbitration, be given the General Commissioner by the 20th instant.

"*Resolved*, That all claims for redivision and the briefs supporting the same shall be submitted to the General Commissioner by the 25th instant.

"*Resolved*, That the General Commissioner shall promulgate his decision on or before the first day of October next."

RATE COMMITTEE.

On the same day a meeting of the Rate Committee was held. Present, Virgil Powers, General Commissioner, Chairman; Milo S. Freeman, Secretary *pro tem.*, and the following members: Sol. Haas, G. A. Whitehead, E. P. Wilson, S. B. Pickens, J. R. Ogden, Jos. M. Brown, and J. M. Culp by Theo. Welch. Absent, W. H. Stanford.

The Chairman stated the object for calling this meeting was to revise cotton rates.

Mr. Whitehead offered the following, which was unanimously carried:

"*Resolved*, That cotton rates named in Circular Letter No. 1, Series of 1882-83, except Atlanta and points based on Atlanta, be made as follows: Brunswick, Savannah, Charleston, Port Royal and Wilmington, be the same as printed in Circular No. 1, Series of 1882-83. Norfolk and group 13 cents higher than Brunswick, Savannah, Charleston and Port Royal. Baltimore 11 cents higher than Norfolk. New York and Philadelphia 17 cents higher than Norfolk. Boston, Providence and Fall River 27 cents higher than Norfolk.

"Atlanta and points based on Atlanta, as follows: Savannah, Charleston, Brunswick, Port Royal, Wilmington and Norfolk be the same as printed in Circular No. 1, Series of 1882-83. Baltimore 11 cents higher than Norfolk. Boston, Providence and Fall River 29 cents higher than Norfolk. These rates to take effect on and after Sept. 14."

The Committee then adjourned, subject to the call of the Chairman.

ELECTIONS AND APPOINTMENTS.

Canadian Pacific.—Mr. Thomas W. Shaughnessy has been appointed Purchasing Agent. He is now General Storekeeper of the Chicago, Milwaukee & St. Paul.

Carolina, Cumberland Gap & Chicago.—The officers of this new company are: President, Gov. Johnson Hagood, Columbia, S. C.; Vice-President, O. C. King, Morristown, Tenn.; Secretary and Treasurer, S. S. Campbell, New York.

Capt. N. J. Kirk has been appointed Chief Engineer of the Southern Division.

Chicago, Burlington & Kansas City.—Mr. J. A. Jamieson has been appointed Train-Master in place of W. E. Forker, resigned. Mr. Jamieson has been for some years a conductor on the road.

Chicago & Eastern Illinois.—At the annual meeting in Chicago, Oct. 3, the following directors (one third of the board) were chosen to serve three years: F. W. Huidekoper, Chicago; A. Gambriel, J. S. Frayser, Nashville, Tenn. The board re-elected Franklin H. Story President; D. J. Mackey, Vice-President; A. S. Dunham, Secretary; J. C. Calhoun, Treasurer.

Chicago & Western.—At a meeting held in Chicago, Sept 26, the following officers were chosen: President, H. B. Coxe; Vice-President, George Merryweather; Secretary, R. F. Stevens.

Cincinnati, Selma & Mobile.—Mr. A. McCollister has been appointed General Freight and Passenger Agent in place of E. J. Fallon, resigned.

Cornwall.—Mr. Wm. Coleman Freeman has been chosen President in place of A. Wilhelm, resigned. Office in Cornwall, Pa.

Detroit, Mackinac & Marquette.—Mr. D. McCool has been appointed General Superintendent, to date from Nov. 1, in place of Thomas McKeown, resigned. Mr. McCool was formerly on the New York Central, and for two years past has been with General Manager Ledyard, of the Michigan Central, as private secretary.

Florida Central & Western.—Mr. B. S. Henning has been chosen President of this company. He is now Vice-President of the Indiana, Bloomington & Western.

Grand Continental.—The officers of this new company are: President, M. Peggott; Vice-President, John A. Burbank; Secretary, W. A. Richardson; Treasurer, Henry Root. The office is in Quincy, Ill., for the present.

Ithaca, Auburn & Western.—At the annual meeting, Oct. 2, the following directors were chosen: J. W. Dunning, H. N. Lockwood, F. T. Peet, C. E. Shorne, Auburn, N. Y.; S. S. Hewitt, Geneva, N. Y.; H. R. Low, Middletown, N. Y.; S. R. Stone, Sing Sing, N. Y.; Herman Stursberg, Staten Island, N. Y.; A. S. Barnes, Brooklyn, N. Y.; T. C. Christiancy, W. J. Groo, Wm. H. Guion, Theodore N. Koues, New York. The directors elected H. R. Low, President; F. T. Peet, Secretary; A. S. Barnes, Treasurer.

Kaskaskia River, St. Elmo & Southern.—The directors of this new company are: Benjamin F. Johnston, Presley M. Johnston, John B. Leach, Wm. H. Smith, Bowles C. Smith, J. Harvey Johnston, Arthur G. Brown, Alexander M Johnston, Leander R. Stocker, Joseph Micks, St. Elmo, Ill.; Malcolm E. Williams, Effingham, Ill.

Louisville & Nashville.—The office of Mr. L. Howell, General Freight Agent of the St. Louis and Henderson divisions, has been removed from St. Louis to Evansville, Ind. Mr. John S. Knox is appointed General Agent in St. Louis.

Mr. J. M. Wooland is appointed Traveling Freight Agent of the Memphis Division.

At the annual meeting in Louisville, Oct. 4, the following directors were chosen: C. C. Baldwin, John M. Brookman, George C. Clark, C. H. Clark, F. D. Carley, T. W. Evans, E. H. Green, John E. Green, W. C. Hall, Jacob S. Rogers, George A. Washington, W. S. Williams, James T. Woodward. The new directors are Messrs. Brookman, Hall, Rogers and Williams, who succeed E. P. Alexander and H. Victor Newcomb, the number of directors being increased from 11 to 13. The board elected C. C. Baldwin, President; Milton H. Smith, First Vice-President.

Midland, of Ohio.—The officers of this company are: President, George Melvin; directors, C. H. Brownell, Mills Gardner, Daniel McLean, John D. Stucky; Secretary, M. Willard. Office at Washington Court House, Ohio.

New York & New England.—General Manager Felton gives notice of the following assignments of officers: L. B. Bidwell, Chief Engineer; A. K. Mansfield, Superintendent of Motive Power.

Eastern Division, C. C. F. Bent, Superintendent; F. L. Hills, Engineer Maintenance of Way; C. B. Moore, Master Mechanic; R. B. Bailey, Road Foreman of Engines; J. O. Bacon, Train-Master.

Providence Division, L. W. Palmer, Superintendent; Richard Colburn, Master Mechanic.

Western Division, T. W. Kennan, Superintendent; L. Holbrook, Engineer Maintenance of Way; E. M. Humstone, Master Mechanic; Thomas Sprague, Train-Master.

Norwich & Worcester Division, P. St. M. Andrews, Superintendent; Richard Colburn, Master Mechanic.

The superintendents of the Providence and the Norwich & Worcester divisions will perform the duties of engineer maintenance of way and train-master on their respective divisions.

New York, Pennsylvania & Ohio.—The following circular from President Adams announces officially a change hereto fore noted:

"Mr. P. D. Cooper having, greatly to our regret, resigned his position, Mr. James M. Ferris has been appointed General Manager, to take effect on Oct. 1."

Mr. N. F. Wood is appointed Superintendent of the Mahoning Division, to date from Oct. 1.

Pacific Coast.—The directors of this company are: Charles Goodall, Edwin Goodall, John L. Howard, W. H. Knight, Wm. Morris, S. O. Putnam, John Rosenfeld.

Pennsylvania.—The following appointments are announced by Mr. F. L. Sheppard, Superintendent of Motive Power of the Pennsylvania Railroad Division:

"Caspar P. Worthington has been appointed Motive Power Clerk. Shop clerks will forward to him at Altoona their usual monthly reports and statements and communicate with him concerning them. To date from Oct. 1.

"William B. Norris has been appointed Master Mechanic of Blairsville shops, *vice* C. B. Street, transferred. To date from Oct. 1."

Peoria & Pekin Union.—Mr. Edward Gale has been appointed Ticket Agent at Peoria Union depot in place of William Wincup, resigned. Mr. R. A. Bunker (Treasurer Peoria Decatur & Evansville Railway), has been appointed Treasurer, to whom all remittances should be made, and on whom all drafts should be drawn. The duties of Auditor will be performed by the General Superintendent. All communications regarding accounts should be sent to his office in Peoria, Ill. These appointments took effect October 1.

Philadelphia, Wilmington & Baltimore.—The board has elected Frank Thomson Vice-President in place of A. J. Cassett, resigned, and Charles E. Pugh General Manager, to succeed Mr. Thomson. These changes are consequent upon those in the Pennsylvania Railroad management.

St. Louis, Keokuk & Northwestern.—Mr. J. A. Jamieson has been appointed Train-Master in place of W. E. Forker, resigned.

Toronto, Grey & Bruce.—At the annual meeting in Toronto, Ont., last week, the following directors were elected for the ensuing year: Wm. Hendrie, R. W. Elliot, Wm. Thomson, N. Kingsmill, Valancey E. Fuller, John Proctor, E. B. Osler, Wm. Ramsay, Wm. Hope. At a subsequent meeting of the board, Wm. Hendrie was re-elected President and Wm. Ramsay, Vice-President.

Traders' Dispatch.—Mr. Wm. H. Smith has been appointed General Manager of this new fast freight line, which is to run over the New York, Chicago & St. Louis and connecting roads. He has been for several years General Accountant of the Canada Southern Line.

Vicksburg, Shreveport & Pacific.—At the annual meeting, Oct. 2, the following directors were chosen: E. Richardson, H. E. Waddell, Vicksburg, Miss.; Frederick Wolffe, Montgomery, Ala.; John Scott, Cincinnati; E. R. Bacon, Charles E. Lewis, Fredinand Miller, Otto Plock, New York. The board elected Otto Plock, President; John Scott, General Manager; D. Graff, Secretary and Treasurer.

PERSONAL.

—Mr. Seth Frink, General Freight Agent of the Missouri Pacific and leased lines, has tendered his resignation.

—Mr. Thomas McKeown has resigned his position as General Superintendent of the Detroit, Mackinac & Marquette road, to date from Nov. 1.

—Mr. W. E. Forker has resigned his position as Train-Master of the Chicago, Burlington & Kansas City and the St. Louis, Keokuk & Northwestern roads.

—It is reported that Mr. George Olds, for some time past with the Chicago, Milwaukee & St. Paul, has been offered the position of General Freight Agent of the Missouri Pacific road.

—Mr. P. D. Cooper, late General Manager of the New York, Pennsylvania & Ohio road, will make his home for the present at Beaver Dam, Wis. He still hopes for a complete restoration to health.

—Mr. James M. Hall having been appointed General Passenger Agent of the Wheeling & Lake Erie road, his former associates on the Wabash road came together in Toledo Sept. 23, and presented him with a costly diamond stud and a handsome gold-headed cane.

—Mr. Russell Elliott, for eight years past Auditor of the Indianapolis & St. Louis Company, is retired by the reorganization of that company. Before his appointment as

Auditor, Mr. Elliott was Assistant Treasurer of the company for five years, and he had previously served on the Cleveland, Columbus, Cincinnati & Indianapolis as Paymaster for seven years.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1882.	1881.	Inc. or Dec.	P.c.
Nine months ending Sept. 30:				
Chi. & Gd. Trunk	$1,487,378	$1,058,487	I. $428,891	40.5
Denver & R. G..	4,772,034	4,168,273	I. 603,761	14.5
Mil.,L.S. & West.	647,635	429,041	I. 218,594	50.9
Eight months ending Aug. 31:				
Ches. & Ohio.. ..	$2,097,359	$1,784,077	I. $313,282	17.6
Net earnings..	615,375	235,873	I. 379,502	160.8
South Carolina..	726,607	729,924	D. 3,319	4.6
Seven months ending July 31:				
St. L., Ft.Scott & Wichita	$122,690	.....	.. ..	....
South. Pacific, Northern Div..	664,478	.....	.. ..	....
Month of July:				
So. Pacific, No. Div.	$130,570	.....	.. ..	....
St. John & Maine	18,073	$19,590	D. $1,517	7.7
Month of August:				
Ches. & Ohio	$381,454	$262,858	I. $118,596	45.0
Net earnings..	172,944	47,872	I. 125,072	260.6
N. Y., Penna. & Ohio.....	493,893	462,523	I. 31,370	6.8
South Carolina..	79,822	81,411	D. 1,589	1.9
Month of September:				
Denver & R. G.. ...	$595,303	$589,287	I. $6,019	1.0
Mil., L. S. & W.....	83,012	65,013	I. 17,999	27.7
Union Pacific.....	2,949,112	2,844,357	I. 104,755	3.7
Third week in September:				
Chi. & Alton.....	$233,700	$189,386	I. $44,314	23.4
Chi. & Eastern Ill..	45,980	41,295	I. 4,685	11.4
Hann. & St. Jo.....	54,183	50,166	I. 4,017	8.0
Ind., Bloom. & W..	67,454	63,461	I. 3,093	4.9
N. Y. & N. England.	86,519	79,702	I. 6,817	8.5

Grain Movement.

For the week ending Sept. 23, receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

	—Northwestern shipments.—				
Year.	Northwestern receipts.	Total.	By rail.	P. c. by rail.	Atlantic receipts.
1876....	6,217,476	4,225,204	1,797,847	42.5	3,192,147
1877 ..	7,338,814	5,096,778	1,119,699	22.0	5,792,479
1878....	5,317,775	4,484,885	1,306,668	29.1	5,609,964
1879....	6,920,279	5,063,693	1,443,261	28.5	7,181,591
1880....	8,329,942	6,098,442	1,952,753	32.0	6,274,974
1881....	5,991,875	4,448,928	2,56 ,493	57.7	4,672,362
1882...	5,376,306	4,663,896	1,752,698	37.6	4,523,565

The whole movement for the week this year is decidedly light. The receipts of the northwestern markets are smaller than in the corresponding week of any previous year in the table, except 1878; they are also 521,000 bushels less than the week before, and the smallest for five weeks.

The shipments of these markets were a little more than last year, but less than in 1877, 1879 and 1880. They were 351,000 bushels less than the previous week of this year, and are the smallest for five weeks. The rail shipments especially fell off, and were the smallest for six weeks. The shipments down the Mississippi amounted to 285,815 bushels, or 6.1 per cent of the whole.

The Atlantic receipts were smaller than in any corresponding week since 1876, but not much less than last year. They were 522,000 bushels less than the previous week, and were the smallest since July 22.

Of the Northwestern receipts Chicago had 53.2 per cent., Toledo 15.1, St. Louis 10.7, Milwaukee 6.1, Peoria 5.8, Detroit 4.6, Duluth 4.1, and Cleveland 0.4 per cent. Milwaukee continues to gain, but quite slowly. Duluth shows the most marked improvement, and received more than in any entire month of this year previous to September. St. Louis shows a great falling off, and has much smaller receipts than in any other week since the first week of July, and not half its average for that time.

Of the Atlantic receipts New York had 59.1 per cent., Baltimore 17.4, Boston 7.7, Philadelphia 5.5, Montreal 5.2, New Orleans 4.8 and Portland 0.3 per cent. The decrease from the previous week was 48 per cent. at New Orleans, 45 at Philadelphia and 36 at Boston, but only 3½ per cent. at New York. At Montreal and Baltimore the receipts were larger.

Of the exports for the week 49.6 per cent. went from New York, 18.8 from Baltimore, 11.9 from New Orleans, 8.4 from Philadelphia, 7.8 from Montreal, and 3.5 from Boston.

For the week ending Sept. 27 the exports were 3,295,399 bushels of grain and 163,109 barrels of flour this year, against 2,942,329 bushels and 75,993 barrels last year, and 4,773,358 bushels and 109,969 barrels in 1880.

For the eight weeks ending Sept. 27 exports have been:

	1882.	1881.	Inc. or Dec.	P. c.
Flour, bbls..	1,032,553	645,722	I. 386,831	59.6
Wheat, bu.....	28,651,080	18,523,481	I. 10,127,599	54.7
Corn "	300,049	9,207,429	D. 8,907,380	96.7
Other grain....	248,486	415,886	D. 167,400	40.0
Flour and grain, bu..	33,846,103	31,052,545	I. 793,558	2.6

The aggregate for the eight weeks is about the same this year as last, but this year more than 98 per cent. of the exports were wheat and flour, last year but 17 per cent.; the exports of corn having almost ceased this year, being not 1 per cent. of the whole, while last year they were 30 per cent.

For the week ending Sept. 30 receipts and shipments at Chicago and Milwaukee have been:

	—Receipts.—		—Shipments.—	
	1882.	1881.	1882.	1881.
Chicago...	3,724,997	3,038,104	2,380,877	2,412,965
Milwaukee...	405,128	401,261	212,715	174,151
The two.....	4,130,125	4,039,365	2,593,592	2,587,116

Both receipts and shipments were thus nearly the same this year as last. The receipts were much larger than in previous weeks this year, especially at Chicago, which is sufficiently accounted for by the corner in wheat, which made the price for September deliveries about 15 cents a bushel higher than for October deliveries.

Receipts and shipments at Buffalo for the week ending Sept. 30 were:

	—Receipts.—		—Shipments.—	
	1882.	1881	1882.	1881.
By rail..	561,000	689,500	1,449,500	1,100.000
By water	1,565,800	1,428,000	913,470	852,500
Total.....	2,126,800	2,117,500	2,362,970	1,952,500

While the total receipts were nearly the same this year as last, there was a *decrease* of 128,500 bushels in the rail receipts and an increase of 137,800 in the lake receipts. In shipments there is an increase of 410,470 bushels this year, 349,500 of which is in rail shipments.

For the week ending Sept. 30 receipts at four Eastern ports for three years have been:

Bushels:	New York.	Boston.	Phila.	Baltimore.	Total.
1882.. ..	919,244	277,812	140,900	983,187	2,241,143
1881.....	3,078,958	400,915	407,230	372,155	4,259,258
1880.....	3,261,228	385,395	423,800	751,118	4,821,541
P. c. of total:					
1882. ..	41.0	12.4	6.3	40.3	100.0
1881 . . .	72.3	9.4	9.6	8.7	100.0
1880.....	67.6	8.0	8.8	15.6	100.0

The receipts reported at New York are so much smaller than in previous weeks that we suspect some error in them. They were nearly three times as great in each of the two previous weeks, and had averaged 2,526,000 a week since July. New York suffered greatly in this week, however, by the break in the canal, which almost put an end to canal receipts, these being reported as only 58,200 bushels this year, against 1,527,000 last year and 2,330,000 in 1880. The Philadelphia receipts are also unusually light. Philadelphia and Baltimore together had 46.6 per cent. of the whole this year, against 18.3 last year and 24.4 in 1880.

For the nine weeks since July, receipts and shipments of wheat, corn and oats, at Indianapolis, Peoria, Chicago, Milwaukee, Detroit and Toledo have been:

	—Receipts.—			—Shipments.—		
Week to	Wheat.	Corn.	Oats.	Wheat.	Corn.	Oats.
Aug. 7...	1,784,228	1,004,752	318,235	2,248,733	955,051	442,577
Aug. 14...	906,261	1,087,494	585,180	1,332,419	955,102	492,523
Aug. 21...	1,188,833	1,370,026	1,372,098	1,297,303	1,185,078	853,174
Aug. 28...	1,893,983	1,548,286	1,938,715	1,243,804	1,246,792	1,644,622
Sept. 4...	2,424,193	1,649,956	1,991,700	1,824,105	1,361,477	1,573,383
Sept. 11...	2,345,814	1,437,744	1,198,715	1,904,377	701,007	1,463,396
Sept. 18...	2,128,277	1,279,105	896,459	1,797,394	1,233,769	966,963
Sept. 25...	2,129,198	1,550,142	668,750	1,799, 87	920,394	949,944
Oct. 2...	2,594,197	1,207,431	782,466	1,502,291	925,461	692,639

The receipts of wheat were thus larger in the last week than in any other, for which the Chicago corner was partly responsible, doubtless. The shipments, however, were smaller last week than in any other of the nine except the second of August.

Buffalo grain receipts to Sept. 30 are reported as follows, flour in barrels and grain in bushels:

	—Flour.—		—Grain.—	
	1882.	1881.	1882.	1881.
By lake.....	1,196,254	728,678	34,531,725	46,151,519
By rail.....	498,710	691,600	18,868,000	25,099,300
Total.....	1,694,964	1,420,278	53,409,725	71,250,819
P. c. by rail ..	29.4	48.7	35.3	35 2

There wa an increase of 274,686 barrels, or 19.3 per cent., in flour, and a decrease of 17,841,094 bushels, or 25.6 per cent. in grain. There was a large decrease in rail receipts of flour.

Shipments eastward of grain received by lake were, in bushels:

	1882.	1881.	Decrease.	P.c.
By canal..... ..	21,464,184	24,476,638	3,012,454	12.3
By rail.....	8,560,307	17,657,107	9,096,740	51.5
Total.	30,024.551	42,133,745	12,109,194	28.7
P.c. by rail.....	28.5	41.9	13.4	....

The canal opened April 11 this year and May 17 in 1881.

During the present season up to Sept. 30, there were 4,846 boats cleared from Buffalo on the Erie Canal, and $240,023 tolls received, against 4,848 boats and $253,106 tolls last year.

Coal Movement.

Coal tonnages for the week ending Sept. 23 are reported as follows:

	1882.	188 .	Inc. or Dec.	P.c.
Anthracite.....	713,404	601,940	I. 111,464	18.5
Semi-bituminous..	118,866	95,799	I. 23,067	24.1
Bituminous, Pa.....	61,469	49,794	I. 11,675	23.4
Coke, Penna.....	44,794	45,294	D. 500	1.1

The anthracite market is unchanged, in spite of the increase in list prices made for Oct. 1. Demands are not pressing, and orders are generally filled at about August prices.

There is still much complaint of a scarcity of cars in the Pennsylvania bituminous regions, and a somewhat short supply at the seaboard in consequence.

The coal tonnage of the Pennsylvania Railroad for the week ending Sept. 23 was: Coal, 179,980; coke, 44,794; total, 224,774 tons. The total tonnage this year to Sept. 23 was 7,974,956 tons.

Shipments of Cumberland coal from the mines for the nine months ending Sept. 30 are reported as follows:

	1882.	1881.	Inc. or Dec.	P.c.
Cumberland & Pa. R. R....	568,278	1,374,990	D. 806,712	58.6
George's Creek & Cumberland.....	89.105	113,424	D. 24,319	21.4
W. Va., Central & Pitts.....	187,815	.....	I. 187,875	....
Total..... .	845,198	1,488,414	D. 643,216	43.2

This does not include shipments made by some of the companies direct to the Baltimore & Ohio, which amounted to about 25,000 tons.

Shipments away from the region for the nine months were as follows:

Baltimore & Ohio Railroad....	635,121
Bedford Div., Pennsylvania R. R.	112,470
Chesapeake & Ohio Canal..... ...	110,053
Total.....	857,644

The total production for the nine months is reported at 865,050 tons. Shipments at present are very large, and promise to continue so for some time.

Cotton.

Seaboard receipts in September are reported by the *Commercial and Financial Chronicle* as follows, in bales:

1882.	1881.	1880.	1879.	1878.	1877.
296,957	429,777	493,664	410,939	377,448	153,111

The receipts this year were thus smaller than in any previous since 1877, and 31 per cent. less than last year, when the crops were very poor. But the crop was late this year. In the last week of the month the receipts were larger than in the corresponding week of any previous year except 1879 and 1880. The weather has generally been very fine for picking and maturing the "top crop," and in Texas it is said that more cotton will be grown than can be picked, there being a short supply of labor there.

The exports in September were:

	1882.	1881.	Decrease.	P.c.
Bales.....	118,329	193,918	75,589	39.0

The exports were also 43 per cent. less than last year's in the last week of August.

Lake Superior Iron Ore.

Shipments of iron ore from the Lake Superior region for the season up to Sept. 27 are reported by the Marquette *Mining Journal* as follows:

	1882.	1881.	Increase.	P.c.
From L'Anse.....	49,799	40,587	9,212	22.6
From Marquette.....	764,646	553,772	210,874	38.1
From Escanaba.....	1,371,569	1,085,055	286,514	26.4
From St. Ignace.....	41,362	.....	41,362	....
Total.....	2,227,376	1,679,414	547,962	32.6

Escanaba shipments have not increased so much in proportion as those from Marquette. Of the Escanaba shipments 527,402 tons were from the Marquette District, and 844,167 tons from the Menominee District.

Besides the shipments of ore from Marquette, 62,182 tons of ore were delivered to local furnaces.

Shipments of pig iron were 7,016 tons from Marquette and 2,926 from St. Ignace, a total of 9,942 tons.

The total shipments for the season will probably run up to more than 2,600,000 tons.

Chicago-St. Paul Rates.

The first tariff of the Northwestern Association makes the following rates in cents per 100 lbs. between Chicago, Milwaukee or St. Louis and St. Paul, Minneapolis and Minnesota Transfer.

Class.							
1.	2.	3.	4.	A.	B.	C.	D.
50	40	30	20	20	15	15	15

Class.				
Coal oil.	Emigrant movables.	Lumber.	Salt, etc.	Coarse grain.
20	20	15	10	17

Rails and pig iron per ton of 2,240 lbs. are $3 per ton; horses and mules are $60 per car, cattle and hogs $40, and sheep (in single-deck cars), $35.

From and to Rock Island, Davenport and Moline the rates are about 14 per cent. less; and between Des Moines and Lake Michigan they are 50 per cent. more for the numbered classes, and as follows, in cents, per 100 lbs., for the others:

—Class.—				Wheat and flour.	Coarse grain.	Lumber.	Salt and cement.
A.	B.	C.	D.				
35	30	25	20	25	20	20	19

For horses and mules the rate is $72 per car, for cattle $60, and for sheep $49.

Pacific Through Freights.

Shipments of through freight eastward from California points in August were, in tons:

	Central Pac.	Southern Pac.	Total.
San Francisco....	10,318	4,107	14,425
Interior points..	2,730	4,380	7,110
Total.	13,048	8,487	21,535
Per cent. of total..	60.6	39.4	100.0

San Francisco furnished nearly 80 per cent. of the shipments over the Central, but 51½ per cent. of the Southern shipments came from interior points.

Minneapolis Flour Rates.

A dispatch from Minneapolis, Minn., Oct. 4, says: "A consultation was held in this city to-day between S. S. Merrill, of Chicago, Milwaukee & St. Paul; President Porter, of the Chicago, St. Paul, Minneapolis & Omaha, and Cable, of the Chicago, Rock Island & Pacific, in regard to the question of continuing the pool for the delivery at Milwaukee and Chicago of flour from this point and points north. The meeting resulted in a disagreement and the breaking of the pool, Messrs Porter and Cable both giving notice that their companies would withdraw. The officials are reticent, but stated that the other companies charged the Chicago, Milwaukee & St. Paul with violating the compact by shipping wheat to mills in the southern part of the state, and thence reshipping it in flour outside of the pool arrangements."

Crops.

An excellent crop of tobacco is reported in Virginia and North Carolina, which will be of advantage especially to the Richmond & Danville and the Norfolk & Western roads.

The Tennessee Commissioner of Agriculture reports the crop of corn in that State to be 172 per cent. of an average, cotton 104, and tobacco 117. Grain is a more important crop in Tennessee than in any of the states further south. In 1880 it produced 62,500,000 bushels of corn, which is nearly as much as the aggregate crops of Georgia, Alabama and Mississippi.

Limited Tickets.

Commissioner Fink has just issued the following circular, giving the resolution passed by the General Passenger Agents of the trunk lines at the meeting of Sept. 8, 1882:

"*Resolved*, That on and after Sept. 15, 1882, limited first-class, second-class and theatrical tickets (by all routes over which regular tickets are sold) between New York and Cincinnati, St. Louis and Chicago, shall be sold good for continuous train passage only; also that the same class of tickets between New York, Louisville and Nashville shall be restricted to continuous train pa sage east of Cincinnati; provided, however, that it shall be understood by connecting lines, if trains miss connections, conductors shall be instructed to honor such tickets by the next succeeding train. Western connections are advised of this, with the request that similar action be taken with regard to east-bound limited tickets."

A meeting of general passenger agents was held in Chicago last week to arrange for the issue of limited and continuous tickets.

A Bad Season for Lake Vessels.

The Chicago *Tribune* of Sept. 29 says: "It is said that most of the large sail vessels now in port and on their way here will be laid up and their insurance canceled, there being more money in this course than to keep them in commission at the present carrying rates for both down and up cargoes. Even should this be done the steam lines will be amply able to furnish all the tonnage required by shippers. It is not believed by the best-informed vesselmen that after owners of sailing vessels have paid all their debts that any one of them will be able to figure out any profit from this season's business, and in many cases will find that they have lost money. Grain freights have never got beyond 3½ cents a bushel to Lake Erie ports, and taking the season all through the average will not be over 2 cents a bushel. The opening rate was 2½ cents a bushel on corn (paid the schooner Wells Burt, the first vessel chartered in 1882 to carry grain to Buffalo), since which time the rate has varied all the way from 1¼ to 3½ cents. Rates to upper Canadian ports have never exceeded 2 cents a bushel, most of the time ruling at 1½ to 1⅝, while the rate to Lake Ontario ports has varied all the way from 4¾ to 6½ cents. It will be seen at a glance by those who know anything about the expense attached to sailing a vessel that these rates will leave no margin to owners, and that the determination to lay their vessels up is a wise and sensible move on their part."

New York to Cincinnati via Savannah.

The Cincinnati *Commercial* of Sept. 27 says: "The pool rate on dry goods from New York city to Cincinnati is 55 cents per 100 lbs. The rate on same class, Cincinnati to Savannah, is 95 cents. There is, of course, no pool rate from New York to Cincinnati *via* Savannah, and thereby hangs a pretty tale. The Cincinnati Southern and connections, taking advantage of steamers returning from New York to Savannah light, and of the proportion of empty cars in northward bound traffic, have been bringing dry goods from New York to Cincinnati *via* Savannah, at a rate competing successfully with the trunk lines and the Chesapeake & Ohio between New York and Cincinnati."

A Boston Passenger War.

The agreement on passenger rates between Boston and Lynn recently expired, and negotiations for a renewal and for a lease of the Boston, Revere Beach & Lynn road to the Eastern Railroad Company having failed, the Revere Beach Company has reduced its rates from 25 cents to 5 cents. The Eastern at once made the same reduction in fares between the two points by its East Boston Branch, and also put on additional trains. Five cents for the railroad ride of nine miles and the ferry crossing from East Boston to Boston is a rate of which no reasonable passenger should complain. The Eastern has the advantage in the fight, this traffic forming but a small part of its whole business, while it is the entire support of the Revere Beach road.

Georgia Commission Rates.

The Georgia Railroad Commission has issued a circular reducing the maximum allowed on lumber 20 per cent. below the rates fixed for class P of the standard tariff.

Another circular permits an increase of 10 per cent. over the standard tariff on the Richmond & Danville lines, and an increase of 20 per cent. on fertilizers. Some increases are also allowed on several short local lines.

The following circular announces an important change, which will cause many changes in rates, the policy of the Commission heretofore having been to allow separate lines to be considered as distinct and connecting roads, even though operated by the same company:

"All connecting railroads which are under the management or control of a lessee, ownership, operation or otherwise of one and the same railroad company, shall in applying the Commissioners' tariffs, for all purposes of transportation within the limits of this state, be considered as constituting but one and the same railroad; and the rates shall be computed as upon parts of one and the same railroad; and all exceptions to this rule heretofore made by this Commission are hereby repealed.

"Under the preceding paragraph, the following railroads will, for all purposes of transportation, be considered as forming different railroad systems; and each system will be considered as one continuous railroad, in computing rates between stations on the different roads, branches, operated or leased lines composing that particular system.

"The Central Railroad system will consist of the Central, the Southwestern, the Savannah, Griffin & North Alabama, the Upson County, and all the branches or railroad lines owned, leased or operated by either of these railroads.

"4. The East Tennessee, Virginia & Georgia system will consist of the East Tennessee, Virginia & Georgia in Georgia, the Cincinnati & Georgia, the Macon & Brunswick and all the branches or railroad lines owned, leased or operated by them.

"5. The Richmond & Danville system will consist of the Richmond & Danville (or Atlanta & Charlotte Air-Line) in Georgia, the Northeastern, the Elberton Air-Line, the Hartwell, the Lawrenceville, the Roswell, the Georgia Pacific.

"6. The Savannah, Florida & Western system will consist of the Savannah, Florida & Western and its branches and leased or operated lines in Georgia, and the Waycross & Florida."

RAILROAD LAW.

Illinois Railroad Law—Inter-State Traffic.

A dispatch from Springfield, Ill., says: "An opinion was rendered yesterday by the Illinois Supreme Court, in a case involving the questions as to the power of the State Legislature to regulate the rates charged by railroad companies for freight carried to points outside of Illinois, and whether the act prohibiting unjust discriminations in such rates is not in contravention with the Constitution of the United States. The case was one in which 66 per cent. greater rate was charged for hauling freight from Gilman to New York than from Peoria to New York, although the distance from Peoria is greater by 86 miles. It was held by the Court that the charge was unjust, excessive, extortionate, and unlawful, and, in effect, the Court upholds the authority of the Railroad and Warehouse Commissioners to regulate the freight charges from points in Illinois to points outside the state."

THE SCRAP HEAP.

Locomotive Building.

The Baldwin Locomotive Works in Philadelphia last week delivered several engines to the Milwaukee & Northern road.

The Rome, Watertown & Ogdensburg shops in Oswego, N. Y., have just completed a new engine, with 17 by 24 in. cylinders and 5 ft. drivers, for the road.

The Brooks Locomotive Works in Dunkirk, N. Y., are building several engines for the Milwaukee & Northern road.

The Boston & Maine shops in Boston have just completed a new heavy passenger engine for the road. They are also building a light double-ender engine to run on the Medford Branch, and will build several more of the same class.

The Pittsburgh Locomotive Works are building several engines for the Pittsburgh, Chartiers & Youghiogheny road.

Car Notes.

The Boston & Maine shops in Boston are building three new passenger cars for the road. They have also begun to build 100 box and 100 flat cars, besides a number of screw-lever dump cars.

The Indianapolis Car Works now employ 620 men and are crowded with work, having many orders to fill.

Some experimental freight cars are on trial on the Cleveland, Columbus, Cincinnati & Indianapolis road, which are of unusual length and have three trucks. The third truck is placed under the centre of the car and supports it, while it is given lateral play enough to suit any curve.

The report that the LaFayette Car Co. would remove its works from LaFayette, Ind., to Chicago, has been contradicted. It is stated that the company has no intention of moving.

Bridge Notes.

Rust & Coolidge, of Chicago, have lately completed a draw-span of 140 ft. over Calumet River for the Chicago & Atlantic road.

Nearly all the bridge builders report business active, and are well supplied with contracts for both railroad and highway work.

The Cleveland Bridge and Car Works, in Cleveland, O., have lately completed eight iron bridges, varying from 75 to 175 ft. span, for the Chicago & Atlantic road.

Iron and Manufacturing Notes.

Chester Furnace at Chester, N. J., owned by W. J. Taylor & Co., is making 250 tons of pig iron a week from Chester and Hacklebarney ores. These ores contain much sulphur, but good results are obtained from roasting them in a Taylor gas-kiln.

Ground has been broken at Harrison, Ill., for the new Bessemer plant of the Harrison Wire Co. of St. Louis.

The Union Iron & Steel Co. in Chicago has three blast furnaces in operation, and will soon start up the fourth. The wire mill has been put on double turn.

The Cuyahoga Steam Furnace Co., in Cleveland, O., is building two large blowing engines for a furnace in Alabama; two heavy steam hammers to go to Louisville, Ky., another for an iron mill in Alabama, and a great variety of other work.

The Solid Steel Co. has been organized at Alliance, O., with a capital stock of $100,000.

All the furnaces in Fayette County, Pa., are in blast, except Fairchance Furnace, which is to start up in a few days.

The rolling mills at Ironton, O., are all busy, running full double turn.

The St. Louis Wire Fence Co. is running its works to their full capacity and has made arrangements to enlarge them.

The Rail Market.

Steel Rails.—Quotations are $45 to $47 per ton at mill for ordinary sections, and $48 to $50 for light rails. It is reported that some of the large orders recently placed were taken as low as $43, but the terms of the contracts have not been made public. No more large transactions have been concluded, though several heavy orders are reported on the market, and likely to be placed soon.

Iron Rails.—The market is extremely quiet, and no transactions are reported, so that it is impossible to make definite quotations. At present prices of steel rails, it seems hardly possible to take orders for iron at profitable rates.

Rail Fastenings.—Spikes are in steady demand at previous quotations, $2.90 to $3 per 100 lbs. The market is almost bare of fish-plates, which are still quoted at $2.65 to $2.75 per 100 lbs.; track-bolts, $3.75 to $4.25.

Old Rails.—In Philadelphia the market is almost bare of old iron rails, and $27 per ton is offered. In New York sales of English rails to arrive have been made at $27 to $28 per ton for tees, and $30 to $31 for double-heads. Crop ends (steel) are in some demand, and are held at $24.50 per ton, against $24 offered.

Steel Blooms.—A sale is reported of 4,000 tons, to be delivered in Boston, at a price equivalent to about $35 per ton, duty paid. There is some inquiry for more at this price.

The Iron Strike.

The last remnant of the iron strike, which lingered at Wheeling, W. Va., has been finally ended, both parties, after some negotiation, agreeing to sign the old scale in force before the strike. Before this agreement was reached a number of puddlers left and went to Chicago.

Testing Locomotive Boilers.

A correspondent writes to the *National Car-Bui der* as follows:

"A very effective and cheap method for testing locomotive boilers, either in the repairing of them or in new work, has been invented by Mr. Robert Wiggins, General Foreman of the Cleveland, Columbus, Cincinnati & Indianapolis shops, at Delaware, O. The method consists in completely filling the boiler with cold water when it is over the pit. A connection is then made with the steam-heating pipes in the pit from any convenient opening in the boiler, the steam turned on, and the water in the boiler heated. When the water is sufficiently heated to approximate the condition of the boiler when in actual service, a small force pump is connected with the boiler, and as the latter is already full of water, a few strokes of the pump, drawing water from a bucket runs the pressure up to any desired height. The whole arrangement is so inexpensive and so effective that it has been adopted at the other shops of the road."

The Forth Bridge.

At the recent meeting of the British Association Mr. B. Baker read a paper on the Forth Bridge. The author gave an amusing illustration of the size of this new bridge. The stature of a new born infant being 19.34 inches, the average height of a guardsman 5 ft. 10½ in., the ratio of these two is as 1: 3.65, and this is exactly the ratio of the span of the Forth bridge to that of the largest bridge at present in this country, viz. the Britannia bridge. The account above alluded to dealt principally with the questions of size and strength; the paper in addition to these points dealt with the history of negotiations and Parliamentary proceedings, and then with mode of construction, weight of materials to be used, and probable cost. No less than 42,000 tons of steel will be used in the superstructure of the main spans and 3,000 tons of wrought iron in that of the viaduct approach. The total quantity of masonry in the piers and foundations would be about 150,000 cubic yards, and the estimated cost of the entire work is about £1,500,000, though from the magnitude and novelty of the undertaking this must be regarded as only an approximate figure.

Train Robbery.

The west-bound passenger train on the Atchison, Topeka & Santa Fe Railroad stopped on Saturday night, Sept. 30, near Granada, Col., to allow an east-bound train to pass. While waiting, two men mounted the engine with drawn revolvers and compelled the engineer to run the train a mile and a half away, where 15 men with revolvers took possession of the entire train. The only shots fired were at Conductor Dees, who had gone forward to learn the cause of the stoppage of the train. The conductor ran back into the smoking car, where a sheriff and deputy sheriff from Raton and a sheriff from Las Vegas were sitting. The sheriffs drew their revolvers, thereby saving the passengers from losing their valuables. The robbers then stole $5,500 in money from the express car, and ordered the engineer to pull out. They got off the train, mounted their horses, which were hitched near by, and departed. A safe in the rear of the express car, containing $10,000, was not touched. A posse of citizens started from Granada the same evening in pursuit of the robbers.

Grading on a Volcano.

The Idaho *Statesman* says: "The activity of volcanic action in the Snake River lava beds, near the line of the Oregon Short Line Railroad, is driving many of the graders from the work. In an area of about 22 square miles, at short distances apart, smoke and flames of peculiar odor, color and shape issue from the chasms and seams in the lava. The irritating sulphurous vapors in themselves cause many to quit work, while the unusual agitation of the boiling springs and the general commotion all over the fields of lava has caused a superstitious fear to take hold of many of the railroad hands, and they are leaving the section, terror-stricken. The whole area has the appearance from a distance of being on fire."

Government Contracts.

Lt.-Col. G. Weitzel, United States Engineers, will receive at his office, No. 1,125 Girard Street, Philadelphia, until Oct. 9, for dredging in Rancocas River, N. J.; in the Delaware River above Bordentown, N. J.; in Chester Creek, Pa.; in Duck Creek, Del.; and for removal of shoals in Mispillion Creek, Del. Also, until Oct. 18, for constructing an additional length of 270 ft. of the jetty at the mouth of Christiana Creek, Del.

Capt. Thos. Turtle, United States Engineers, will receive at his office, No. 70 Saratoga street, Baltimore, until Oct. 10, bids for dredging, rock excavation and dyke work in the James River in Virginia.

He Got Out of the Way.

A traveler was leaning at night against a railing at the Harper's Ferry railroad station. A locomotive came along, and he sprang lightly over the rail to escape possible danger. He thought it was a meadow on the other side, but knew his mistake when he struck in a muddy stream forty feet below. On being rescued he was asked his name. "I wouldn't tell you for a thousand dollars," he replied; "describe me simply as a fool."

A Singular Accident.

The Milwaukee *Republican-Sentinel*, of Sept. 21, is responsible for the following strange story:

"Passengers who arrived in the city yesterday morning gave the particulars of an accident which occurred Tuesday morning at 6:45 o'clock on the Northern Wisconsin Division of the Chicago & Northwestern Railway, one mile south of Oconto, and which is the most extraordinary in railroad history. The north-bound passenger train, with a large number of passengers, was running along at not less than 25 miles an hour, when her locomotive exploded with gigantic force. 'I was seated in the smoking car, the third from the engine,' said John F. Jerrard, a passenger, 'and knew by the loud report and the heavy shock to the train what had happened. At almost the same moment a mass of rubbish from the explosion fell upon the top of the car, which rattled loudly, but did no other damage. Of course, in a moment the sensation of danger was passed, as the train ran smoothly along, except a peculiar and unnatural sound from the front of the train, which seemed to move along without any perceptible diminution of speed. I concluded that my impression that the boiler had exploded was erroneous, as everything seemed then to be all right, and a gentleman remarked that a torpedo had probably been exploded under the train with a view to mischief. By this time the train had run down and crossed the bridge across the Oconto River, when the brakemen suddenly set the brakes with great exertion and brought the train to a halt. Up to this moment no one on the train knew what the actual situation was except the mail agent and baggagemen, and they were unable for some reason to put on the brakes to stop the train. The train was finally brought to a stand-still. It was then found the forward truck of the engine was loaded handsomely upon the tender, which was intact. It was evident that not an individual on the train, as it stood there was injured, and in fact that the majority of the passensengers did not know that anything had occurred until they were told, as the report was not heard very far back, and many were asleep. But the engineer and firemen—there was but one voice, 'they are dead.' Some of the passengers and the trainmen ran back, and were utterly amazed to find them standing by the wrecked engine, but little worse for the dreadful shaking-up. After a careful examination of the whole ground the following conclusions were reached by me and many others: First, that the explosion had been most terrific; that at the time of its occurrence the engine was lifted from its connection with the tender and violently wrenched clear of it; that at the same moment the cow-catcher was thrown downward as a matter of course, and as was shown by three ties being rooted up and broken in two nearly in the centre, and at the same point by the side of the track lay the nose of the badly demoralized cow-catcher. This must have occurred as the engine was thrown forward into the air with the most terrific force, as was fully established by its being hurled 180 feet forward and along a little to the right of the track before it struck the ground, where it buried itself half out of sight in the mud. Of course, this 30-ton mass of iron must have turned a complete somersault in the air, at which time the forward trucks were dropped upon the tender, where they are now lying. The grass and bushes are blackened and dead by the escaping steam underneath the track where the engine flew through the air. The huge machine took itself and all its immense rubbish, the result of the explosion, absolutely out of the way and left a clean track for the train to pass along, and, strange to say, the rails at the point of the broken ties were scarcely disturbed. But the fireman and engineer were carried along in the cab and landed with it, or very near. One pair of trucks on the mail car jumped the track at the point where the explosion occurred and ran in that situation one mile, passing over the bridge at the Oconto River in that way, and another odd freak, passing a switch a moment before the train was stopped, they ran on again, and no great damage was done except to tear off the heads of all the spikes from one side of the rail for the whole distance, breaking nearly all the bolts which connect the ends of the rails together, all this without one life being lost or any one seriously injured!'"

Trouble on a Trunk Line.

The Cincinnati & Westwood failed to bring any train into the city yesterday morning, the boiler of the locomotive being leaky. The regular passengers walked or drove to the street cars. The conductor, with commendable promptness, came to the city and took back in a buggy an artisan capable of fixing up the bad boiler.—*Cincinnati Commercial, Sept. 27.*

The Return.

It was at the depot. She had been away for several months, and the children had gone to the depot to meet her. They chatted away merrily while she patted their little heads and smiled interestedly.

"How's Mary?" she inquired, when they both stopped for breath.

"Oh! she's well. She's taking her music lessons right along."

"And Harry?"

"He's going to school. Started last week."

"And papa?"

"He's well, too. He's having a bully time. He said he didn't care if you didn't come back for a year."

The passengers roared.

Grabbing the children with both hands, she rushed for the door with an I'll-get-even-with-him-for-this expression on her face. Heaven help him!"—*Baltimore Day.*

A Contrast.

Mr. W. C. Dickinson, station agent on the New York, New Haven & Hartford road at Fairfield, has some curious old documents in his possession connected with the history of the line. First he has the announcement by the "N. Y. & N. H. Railroad," that "on and after Wednesday, Sept. 6, 1848, trains will run between Bridgeport and Fairfield" twice a day! They are advertised to leave Bridgeport at 10:30 in the morning and 1 o'clock in the afternoon, and Fairfield at 11 in the morning and 1:30 in the afternoon. This document is signed by "R. B. Mason, Engineer," and is dated Sept. 5, 1848. Next comes the complete time table of the road issued in January, 1849, giving the distances between the 18 stations between Canal street, New York, the southern terminus of the road, and New Haven, the northeastern end. There were three trains each way, one of which, however, only came as far as Bridgeport. Next

comes an announcement on May 27, 1850, that "a freight train" will run "daily each way between New Haven and New York, leaving New York at 8:15, and New Haven at 8:20 p. m." This is signed "R. B. Mason, Supt." Then we have the time table of freight trains on the New York & New Haven Railroad, made up in August, 1855, and showing two trains each way, a night and day freight, one stopping at Bridgeport and the other going through. This is signed "Jas. H. Hoyt, Supt.," and "E. S. Quintard, Asst. Supt." These are valuable and suggestive documents, and when compared with the time tables of to-day and the amount of work done over the double track of this road, they indicate very vividly the immense growth of this section of the country in the last 35 years. Previous to the opening of the road two stages a day had accommodated the passenger traffic between Bridgeport and New Haven, but immediately after the trains commenced running on the road two special trains a day were required to carry them, showing how quickly the railroad developed a desire to travel among the people.—*Bridgeport Republican Standard.*

Provision for Accidents.

The Central Vermont Railroad Company is now equipping its passenger and baggage cars with racks containing an axe, saw, pail and sledge for use in case of accident. The slats and fastenings of the racks are so constructed that they can be easily broken when it becomes necessary to get at the tools inclosed. These racks have already been put into many of the cars—inside or underneath, or both—and will be put into all cars on the road. It is an improvement in which the company is following the example of a number of others, in New England and elsewhere.

Paper Car Wheels.

The Paper Wheel Co. announces a reduction in the prices of its 42-in. wheels, broad tread, to $95, and the narrow tread to $85. The completion of the company's Morris works, and additional improvements at the Hudson and Pullman works, made necessary by the growing demand for the wheels during the past year, have given additional facilities, enabling the company to make this reduction. The order list is already large, and an increase is expected to follow this lowering of prices.

Screw Gauges.

In the report of the Committee of the British Association on Screw Gauges, it was stated that there is at present no universally recognized form of screw-thread and no specified number of threads to the inch. For telegraphic and electrical apparatus some coherent and uniform system is much wanted. The report gave an account of the efforts made in Switzerland toward this end, and explained the screw gauge finally adopted by that country. Much credit is due to Sir Joseph Whitworth for his important work in connection with the improvement of the system in England. The Committee asked to be re-appointed.

Electric Railways.

Dr. Fleming read a paper before the recent meeting of the British Association upon "Recent Progress in Electric Railways," which was practically a description of an experimental railway laid down by Mr. Edison in Menlo Park. The plan there adopted is to connect one rail at regular distances with one of the terminals of a dynamo in a central station, the other rail being similarly connected with the opposite terminal. The motor has externally the appearance of an ordinary locomotive without a funnel, containing, however, a dynamo, by means of which short circuiting between the rails is prevented, and the motive power obtained. The percentage of useful effect claimed by the author was exceedingly high, only 5 lbs. of coal per hour per horse-power being used, as against 6 lbs. used with an ordinary locomotive. A speed of 40 miles an hour, over 8 or 10 miles, was stated to have been attained. These statements of the author concerning the efficiency of the system described by him were called in question by the President, Prof. Forbes, and others, who complained of the meagre supply of facts upon which to form an opinion on such an important question. Dr. Werner Siemens, at the request of the President, made some remarks with reference to his own experience in electric railways, stating the loss of power to be one-fifth in winter, and one-eighth in summer. Amongst other things he advocated overhead connection of wires to convey the current.

Smoke-Consuming Locomotives.

Some time ago the city of Chicago enacted an ordinance requiring that locomotives within the city should consume their smoke. This resulted in experiments with various devices and fuels, but chiefly in the enforcement of more careful firing. Suits were brought against some companies for creating a smoke nuisance, but these were recently dismissed on the ground that the companies had complied with the ordinance. The Chicago *Tribune* inquired into the methods used and reported as follows:

"We are using one burner," said Superintendent Lyford, of the Chicago & Eastern Illinois, "and it does away with the black smoke to a great extent, but some still comes from the chimney. I watched the locomotive yesterday, and scarcely any smoke was to be seen. We are testing the burner, and if it works satisfactorily we shall put it in all our engines. So far it is very satisfactory, but we are going to give it a thorough trial. We expect now that it will be a success."

"We are not using any burners," said an officer of the Burlington & Quincy, "nor have we changed our fuel. A compromise was effected with the authorities, and a man has been appointed to watch our engines and make complaints if too much smoke comes from them. The engineers and firemen have been instructed to be careful in firing. That is our remedy."

"There must be smoke to some extent," said Augustus Herrington, of the Northwestern, "but there is no necessity for so much as to be a nuisance. We have demonstrated that careful firing is the remedy. Smoke burners themselves are a nuisance. Our engineers and firemen have been directed to fire carefully, and if they don't do it they will be discharged. Prof. Paton examined our road and became satisfied that we were not violating the ordinance."

"We are using coke," said Mr. W. B. Keep, Assistant Attorney of the Lake Shore & Michigan Southern. "It works all right, but is more expensive. Out on the road we burn soft coal. Every passenger locomotive has on 250 lbs. of coke when it leaves the depot, and that lasts until the city limits are reached. Coming in they take on coke enough at Forty-third street to get to the depot. The grates in the switch-engines which are running in and out all the time have been changed so that coke can be used, and that is the case, too, with the engines on the suburban trains. Now and then a freight engine runs in with soft coal, but the smoke nuisance has been done away with on our road."

News Agents.

Following the good example of the Pennsylvania Company, Receiver Stewart, of the Marietta & Cincinnati road, has issued the following regulations for news agents:

"Conductors will be held to a strict account for the enforcement of the following rules, which have been adopted for the government of newsboys on the line of this company:

"Newsboys will announce their wares in a modulated tone of voice, not oftener than three times whilst passing through a passenger car.

"They may enter a sleeping car every two hours (oftener if requested by the occupants), until the berths are lowered, observing same rules as in passenger car.

"They are not permitted to put books, papers or packages on the seats or in the laps of passengers.

"They are not allowed to run for hotels, or railroad and river lines.

"They are required, to dress neatly, wearing the prescribed uniform, and at all times treat the patrons of the road with courtesy and politeness."

OLD AND NEW ROADS.

Atlantic & North Carolina.—At a meeting of the stockholders in Morehead, N. C., Sept. 28, a special committee made a report, claiming that the lease of the road to the Midland North Carolina Company had been forfeited, and stating several causes of forfeiture, the chief being the failure of the lessee to continue the work on the road from Goldsboro to Salisbury, as provided in the lease. The committee also unanimously reported a resolution declaring the lease forfeited, and directing the President of the company to take possession of the property. The further consideration of the report was postponed to Nov. 10, to which date the meeting adjourned.

Boston, Hoosac Tunnel & Western.—The suit of the Attorney General of New York to have this company dissolved on the ground that it had no legal existence in New York came up a short time ago and judgment was given for the company by default. On application of the Attorney General, the Supreme Court has now vacated this judgment and reopened the case.

Boston & New York Air Line.—The remaining injunctions against the lease of this road to the New York, New Haven & Hartford Company have been dissolved, after a hearing before Judge Hovey at New London, Conn., Sept. 28. The Hutchinson injunction had previously been dissolved, as noted last week.

Camden & Atlantic.—It has been reported for some time that purchases of this company's stock were being made in the interest of the Pennsylvania Railroad Company, and it is now stated, apparently by authority, that that company has secured a majority of the stock. The object is to secure control of the heavy travel between Philadelphia and Atlantic City, for which this company competes with the West Jersey road. It is said that no change in the management will be made for the present.

Canadian Pacific.—The branch from Prince Arthur's Landing on Lake Superior to Winnipeg, Man., has been opened for traffic, the contractors running the trains over it for the present.

Track is now laid for nearly 430 miles westward from Winnipeg. On the prairie section of the road some very fast work has been done.

A force of 500 men will be employed through the winter on the line from Prince Arthur's Landing eastward, north of Lake Superior. The winter work will be chiefly on the rock cutting, of which there is a great deal.

Carolina, Cumberland Gap & Chicago.—This company has been formed by the consolidation of the Cumberland Railway Company, of Kentucky; the Morristown, Cumberland Gap & Ohio Railroad Company, of Tennessee; the Morristown & Carolina Railroad Company, of Tennessee; the Atlantic & French Broad Valley Railroad Company, of North Carolina; the French Broad & Atlantic Railroad Company, of South Carolina. The projected line is from Aiken, S. C., by the Eastatoe Gap, Morristown and Cumberland Gap to Livingston, Ky., the estimated distance being 368 miles. A contract has been let to the Atlantic & Northwestern Construction Company, of New York, to build the road in four years, at the rate of 100 miles a year.

Central Pacific.—This company's Northern road is now completed to Tehama, Cal., 36 miles north of the old terminus at Willows. At Tehama this line connects with the Oregon Division, making a very much shorter line from San Francisco to that point than the old one by Roseville and Sacramento.

A large part of the force now at work on the Southern Pacific beyond El Paso will soon be brought back and put on the extension of the Oregon Division from Redding north to the Oregon line. This extension is through a rough and difficult country, where much heavy work will be required, and its completion will require some time.

Cheraw & Chester.—This road has been leased to the Charlotte, Columbia & Augusta Company for 99 years, the lessee agreeing to assume the debt of the company, to pay 1½ per cent. yearly on the stock and to complete the road from the Catawba River east to Lancaster, S. C., seven miles, the extension including a bridge over the river. The road is of 3-ft. gauge, and is now in operation from Chester, S. C., east to the Catawba, 20 miles.

Chicago & Alton.—President Blackstone has issued a circular to the stockholders of the company asking them to vote upon a proposition to increase its capital stock. The circular sets forth that the Chicago & Alton, in its agreement with the Joliet & Chicago Railroad Company for the perpetual use of its road, assumed the obligation to pay the principal of certain mortgage bonds which that company had issued, when the same should become due and payable. The bonds became due July 1 last, and $306,000, being all the bonds of that company then outstanding, have been paid by the Chicago & Alton Company and canceled. The money for that purpose has been taken temporarily from current receipts. On Jan. 1 next the income bonds issued by the Chicago & Alton Company, of which there are outstanding $1,083,000, will be due and payable. To provide money for the payment of the principal of the bonds last referred to, and for reimbursing the account from which money has been taken temporarily, as above stated, for paying the Joliet & Chicago bonds, the board of directors of the Chicago & Alton have resolved to issue and sell additional common stock to an amount limited to 10 per cent., or 14,000 shares. Under the restrictions of the charter of the Chicago & Alton Company, the written consent of three-fourths of the stockholders of the company is required to authorize the proposed increase of capital stock. The new shares will be offered for sale at par to each shareholder owning preferred or common stock in the proportion of one share to each 10 shares of stock owned.

Chicago & Atlantic.—Track is now reported laid on this line from the junction with the Chicago & Western Indiana at Hammond, eastward 69 miles, to North Judson. From the starting-point at Marion, O., westward track is laid to Lima, 55 miles, and tracklaying is in progress rapidly beyond. Track is also laid from Huntington, Ind., east 95 miles and west 80 miles, and work is progressing rapidly at several points. The road from Marion to Hammond will be 249.1 miles long, and will have 40 miles of sidings. The road will have no grades over 26 ft. to the mile, and very few curves, 96 per cent. of the line being tangents. About 61 miles of track remain to be laid.

Chicago & Eastern Illinois.—It is reported in the newspapers that the Chicago & Eastern Illinois is about to be absorbed by the Louisville & Nashville Railroad Company. The fact that the Louisville & Nashville had obtained a controlling interest in the Chicago & Eastern Illinois, and also in the Evansville & Terre Haute Railroad was known about a year ago. These two roads were to have been consolidated with the Louisville & Nashville when the Supreme Court of the United States gave a decision setting aside the sale of the old Chicago, Danville & Vincennes Railroad, to which the Chicago & Eastern Illinois is the successor. Negotiations have been in progress for some time past to compromise the suit with the stockholders of the old Danville & Vincennes, and if the difficulties are settled it is said that the Louisville & Nashville will take possession of the road.

Chicago & Evanston.—This company, which has been organized for a long time, but has done very little work, has been suddenly revived, and has begun work on its line from a point on the Chicago city line to Evanston. The present officers are all connected with the Chicago, Milwaukee & St. Paul, and the tracks of that company's Chicago & Pacific Division are to be used into the city. The road meets with much opposition from owners of property along the line.

Chicago, Milwaukee & St. Paul.—The company has closed a contract with Pullman's Palace Car Company, under which the Pullman Company takes charge of the sleeping-car service over all the St. Paul Company's lines. The contract took effect Oct. 1.

Chicago & Northwestern.—The James River Branch has been extended from Ordway, Dak., northeast six miles to Columbia. At that place an extensive water-power can be made at a small expense.

Chicago, Rock Island & Pacific.—A bill has been filed in the United States Circuit Court at Leavenworth, Kan., on behalf of Leavenworth County as a stockholder of the old Chicago & Southwestern Company, to set aside the foreclosure sale by which the Southwestern road became the property of the Iowa Southern & Missouri Northern Company, which was subsequently consolidated with this company. The bill charges defects in the original organization which would invalidate the mortgage on the road and all subsequent proceedings.

Cincinnati & Southeastern.—The Cincinnati *Enquirer* says: "This road is, indeed, in a bad fix, and, unless matters are amicably adjusted, will be disposed of by the sheriff of Campbell County, Ky., in the very near future. A few weeks ago Messrs. Dickinson & Company, of New York, contractors for the construction of the road, filed a suit against the company for $134,000 in the Chancery Court at Newport, for labor done on the road, and for damages sustained by the company failing to comply with their contract. * * * The road will, in all probability, be sold, as there seems no other outlet for it. Including the amount paid for right of way, there have been over $225,000 expended on the road."

The company was formerly known as the Covington, Flemingsburg & Pound Gap. It has 17 miles of narrow-gauge road in operation from Hillsboro, Ky., by Flemingsburg to Johnson.

Cincinnati, Wabash & Michigan.—This company has executed a mortgage for $1,000,000 to J. H. Wade and C. E. Cowgill, trustees, to secure an issue of bonds to that amount. The new bonds will be used to pay for the extension of the road to Benton Harbor.

Delaware, Lackawanna & Western.—At a meeting of the board held Sept. 29, the directors voted to approve a lease of the New York, Lackawanna & Western road. The rental is to be 6 per cent. on $12,000,000 bonds, and 5 per cent. on $10,000,000 stock.

Denver & Rio Grande.—A dispatch from Denver, Col., Sept. 28, says: "The Denver & Rio Grande Railway has brought suit against the Union Pacific Railway for $350,000 for the unlawful use of their track on the Leadville Branch. The Union Pacific Company claim they are using the track under contract made by the South Park Railroad, purchased by them in January, 1881, the conditions of which contract they have fulfilled."

Eastern Shore.—At a recent meeting of the board a committee was appointed to negotiate a sale or lease of the road, which is the extension of the Delaware road from Delmar to Crisfield, Md., 38 miles. It is said that the Eastern Shore Steamboat Company has made an offer, and that the Pennsylvania Railroad Company offers to buy all the stock at 7, and the bonds at 80. It is hoped to secure better terms.

European & North American.—The following circular is dated Bangor, Me., Sept. 29: "The railway of this corporation, and all its property, has been leased to the Maine Central Railroad Company, and on and after Oct. 1 next the management and control of the same will pass to said company. Unadjusted matters for September current, and anterior thereto, to be settled as heretofore, with the appropriate officers of this company. All new matters, after said first day of October, will be Maine Central matters, and must be treated accordingly."

Fort Wayne, Logansport & St. Louis.—Work is progressing on this road between Ft. Wayne, Ind., and Logansport, where it follows the line of the old Wabash & Erie Canal, and is parallel and close to the Wabash road.

Galveston, Harrisburg & San Antonio.—Trains on this road now run to Devil's River, Tex., 185 miles from San Antonio. The tunnel just beyond Devil's River is completed, and track is laid for 20 miles further, to a point 205 miles from San Antonio. The road is now rapidly approaching a connection with the line for El Paso east.

Georgia Pacific.—Tracklaying has been begun from Anniston, Ala., eastward toward Atlanta. Grading has also been begun on a section of 24 miles from Anniston west to the Coosa River.

Grand Continental.—This is the ambitious name of an ambitious project, which is to be nothing less than a "diagonal trunk line" from Cincinnati to Bismarck, Dak., with Quincy, Ill., where the project originates, as an intermediate point and the headquarters of the company. There is also to be a branch to the Manitoba line or thereabouts, and the capital stock is to be $35,000,000. At present "the managers refuse to make public the names of the New York bankers, giving as an excuse that their permission to publish has not been obtained"—which is extremely probable.

Gulf, Colorado & Santa Fe.—Work has been begun on the branch from Alvin, Tex., 24 miles from Galveston, northwest to Houston. This branch will be 29 miles long, making a line from Galveston to Houston 53 miles long, or

but three miles longer than the Galveston, Houston & Henderson road.

Humeston & Shenandoah.—Track is reported all laid on this road from Humeston, Ia., west to Shenandoah, 113 miles, and trains will soon begin to run over the road. It has been built and will be worked jointly by the Chicago, Burlington & Quincy and the Wabash companies, and is the result of a compromise between those companies, which stopped the building of two parallel lines through the same country.

The road is of importance to the Wabash as completing a connection between its Council Bluffs line and the Peoria & Iowa Division, and thus giving it a pretty direct line between Council Bluffs and Chicago, making the fifth line between those cities. This Wabash line is 561 miles long, or 60 miles longer than the Chicago, Burlington & Quincy, but it is very much shorter than the only connection the Wabash has had hitherto.

Indianapolis & St. Louis.—The stockholders of the new company have authorized the issue of bonds to the amount of $2,000,000, the Cleveland, Columbus, Cincinnati & Indianapolis Company agreeing to guarantee them. The proceeds of these bonds will be used as needed to buy new equipment and put the road in good condition.

Indianapolis & Vincennes.—Surveys have been completed for the branch from Switz City, Ind., to the coal fields in Green county, and the contracts for the work will soon be let.

Jersey Shore, Pine Creek & Buffalo.—Work on this road is now progressing well. More than half the grading is completed, the masonry nearly all laid, and track has been laid for eight miles southward from Stokesdale, Pa., the junction with the Corning, Cowanesque & Antrim road. Tracklaying was also begun at Williamsport on Sept. 27.

Kaskaskia River, St. Elmo & Southern.—This company has been organized to build a narrow-gauge road from a point on the Toledo, Cincinnati & St. Louis, in Shelby county, Ill., southward to a point on the St. Louis & Cairo road in Union county.

Lordsburg & Clifton.—This company has been organized to build a railroad from the Southern Pacific at Lordsburg, N. M., by the Gila and San Francisco cañons to Clifton, Arizona. The distance is 80 miles, through a mining country.

Louisville & Nashville.—Preparations have been in progress for some time for the work on the bridge over the Ohio at Henderson, Ky., to connect the Evansville, Henderson & Nashville and the St. Louis divisions of this road. A large quantity of stone has already been delivered, and the caisson for the first pier was launched at Henderson last week. The foundations for the bridge will involve many difficulties, for which it is believed that full provisions have been been made. The bridge will have 16 spans, and there will be an iron viaduct approach on the Kentucky side, making a total length of 3,686 ft. The channel span will be 525 ft. Of the 16 piers, at least six will be sunk by pneumatic process to solid rock, which is about 42 ft. below low water. The grade of the bridge will be 53 ft. above high water, or about 100 ft. above lowest stage of the river. The bridge is built by the Henderson Bridge Company, Chief Engineer F. W Vaughn and Resident Engineer O. F. Nichols having charge of the work. The contractors for the foundations and masonry are O'Connor & McDonald, of Henderson.

The annual meeting in Louisville resulted in the re-election substantially of the old board, without any very strong opposition, in spite of the charges of mismanagement so freely made, and the reports that the company was in a critical condition financially. The stockholders voted to authorize an increase of the stock to $30,000,000, the new stock (nearly $12,000,000) to be sold to provide for floating debt, future additions to property and other needs of the company.

Louisville, New Albany & Chicago.—It is reported that this company will build a branch from its Chicago & Indianapolis Air Line at Sheridan, 25 miles north of Indianapolis, northeast to Marion, about 45 miles.

Mexican Central.—The following account of the country on the line of this road between El Paso and Chihuahua is given by a correspondent of the Chicago *Tribune:*

"For 100 miles due south of El Paso del Norte there lies a sandy desert almost barren of vegetation. In passing over this we saw but half a dozen houses, all of which have been built since the railroad was constructed. A series of plateaus, rising gradually, surrounded by mountains that seem to link into each other, characterizes Mexico for 600 miles south of New Mexico. Each plateau has somewhere near its centre a lagoon, into which it drains. These lagoons seem to have no connection with each other, and I am told that none of this system of plateaus, some 600 by 400 miles in extent, drains into the sea—a rather remarkable fact. The water of the lagoons is intensely alkaline, and varies in temperature from 65 to 85 degrees.

"A few miles out of El Paso del Norte lie a number of sand-hills, some of which are over 400 feet high, which were said to shift their positions at every wind-storm. The problem of getting past these hills was the first thing to stare ex Gov. Anthony in the face. A personal examination of the hills, however, showed Mr. Anthony that the sand of the hills was damp a few inches under the surface, and that there was as little probability of their moving as there was that Pike's Peak would slide down into Mexico. He accordingly cut one of the hills in two, and constructed the track through the passage thus obtained, and has had no trouble from the hills whatever. He found at first, however, that in the exposed portions of the road over the plateau, the wind would blow away the sand almost as fast as his men could shovel it between the ties. To overcome this he put a foundation of adobes under each tie, and ballasted the track with the same material. After that the sand simply blew over the track and bothered him no more.

"From El Paso the road rises gradually to San Jose, a point 75 miles south, were it reaches the greatest altitude, 5,500 ft. The country along this portion of the road, while a desert in its character, has been in many places transformed into rich grazing lands by the construction of irrigating ditches. We passed, a few miles from San Jose, an irrigating ditch, said to have been constructed by the Aztecs several centuries ago, that is 75 miles in length, and has made fertile a great extent of the desert lands. A lack of water seems to be one great trouble in this country, and the Mexicans do not appear to have had any idea of boring or digging for water where it might easily have been obtained by those means.

"From San Jose the country falls for a few miles, and then rises again as Chihuahua is approached, the altitude of the city being something over 4,500 ft. About 140 miles from El Paso del Norte the desert began to lose its barren aspect, trees began to appear, and the grass showed itself in greater quantities. From this point the character of the country changes rapidly, rich grazing lands being met with about 200 miles from El Paso. South of Chihuahua, which is in the midst of a fine grazing country, and surrounded by hills rich in silver and gold, the vegetation becomes almost phenominally luxuriant. Fruits of all kinds—tropical and otherwise—grain, and vegetables, grow rapidly in the greatest profusion. Luscious pears, grapes, pomegranates, peaches and apples are raised all about Chihuahua, and sold for next to nothing at the city markets.

"Our train approached Chihuahua Friday night in a very cautious manner, preceded by a pilot-engine. The last six miles of the road were built in less than 48 hours, and there was some fear that an accident might result through the necessarily unfinished condition of this part of the road. Several miles out of the city we discovered that the town was illuminated—thousands of lights twinkling brightly in the clear atmosphere. We did not go as far as we could that night, but stopped over a mile outside of the city, and took a drive around it in carriages. Chihuahua is 234 miles south of El Paso, is the capital of the state bearing the same name, is over 350 years old, and has a population estimated at 18,000. Years ago, when the Apaché Indians swarmed in the northern part of the state of Chihuahua, and often carried their depredations to the borders of the city, the Mexicans owned large herds of mules and cattle that grazed in the surrounding country. The stock was run off and slaughtered by the Indians, the Mexican stockmen were intimidated and gave up their ranches for fear of being killed, and the stock interest of the country has never recovered itself. Cut off from intercourse with northern cities on account of the difficulties of travel, six to ten days being required to get from Chihuahua to El Paso, the rapid progress of its people was strangled. Chihuahua became, however, the centre for the trade of surrounding towns. People came for 300 miles to do their trading at the capital, and the city was thus forced to grow, though very slowly. As the Indian depredations became less frequent and the dangers of travel lessened, a trade sprang up between Chihuahua and the southwestern towns of the United States. This has never been extensive, however, and the people were practically isolated from all connection with the United States. The majority of their goods were imported from England and other European countries."

Midland, of Ohio.—A contract for the building of this road has been let to an organization known as the Midland Railroad Construction Company. The road is to run from Columbus, O., through Washington Court House to New Vienna, in Highland County, where it will connect with the Marietta & Cincinnati road. It will be about 50 miles long.

Minnesota Central.—Track on this new road is reported laid from Waterville, Minn., on the Minneapolis & St. Louis, east by north to Faribault, 17 miles. From Faribault to Northfield, 12 miles, the line is graded, and work is progressing eastward to Red Wing.

New York, Lackawanna & Western.—It has generally been supposed that this road would be operated by the Delaware, Lackawanna & Western, and it is now announced that that company will lease the road, paying as rental the interest (6 per cent.) on $12,000,000 bonds, and 5 per cent. on the $10,000,000 stock. This will make a yearly rental charge of $1,220,000 on 204 miles of road, or $5,980 per mile.

New York, Susquehanna & Western.—This company will, in a few days, begin running regular trains over its new extension from Two Bridges, N. J., to Stroudsburg, Pa. The connections with the Delaware, Lackawanna & Western road will, it is expected, be completed shortly, so that coal trains will begin to run over the road about the end of the present month.

Northern Central.—The Pennsylvania Railroad Company has taken all of the new stock of the Northern Central which was offered to the stockholders in June last. The issue was $600,000, made to furnish funds for the purchase of the Union road and tunnel, in Baltimore, from the Canton Company. Only about half the stock was taken at the time, and the Pennsylvania will now take the remainder.

Ohio & Mississippi.—Receiver Douglas reports to the Court for the month of August as follows:

Cash on hand, Aug. 1	$35,528
Receipts from all sources	597,796
Total	$633,324
Disbursements	583,536
Cash on hand, Sept. 1	$49,788

The receipts exceeded the disbursements by $14,260 for the month.

Oregon & Trans-Continental.—President Villard has issued the following: "Statements submitted to the Executive Committee Thursday showed a fund immediately available for dividends amounting to nearly $4,000,000, and further an additional estimated income during 1883 of nearly $3,000,000. The Executive Committee recommended to the full board of directors that regular quarterly dividends be commenced in January next, and that the first one, in pursuance of conservative policy, should be at the rate of 1½ per cent. only. The rate of dividends thus recommended for January will, of course, justify larger dividends thereafter, as the dividend fund will remain unimpaired. The meeting of the Executive Committee voted further to recommend to the board of directors an additional issue of $10,000,000 capital stock for the purpose, under existing contracts, of delivering 50,000 shares of Oregon & Transcontinental Company's stock to a syndicate, in exchange for an equal amount of preferred stock of the Northern Pacific Railroad, and for paying for further amounts of Oregon Railway & Navigation stock which it expects to acquire by contract during the next 15 months, as well as for working capital for constructing branch roads should the condition of the market render further issues of bonds undesirable."

Ottawa, Waddington & New York.—A proposition for the construction of this road, including a bridge over the St. Lawrence, has been made by English capitalists, and is now under consideration.

Ousatonic Valley.—This company has been organized and surveys made for a short line from the New York & New England road at Sandy Hook, Conn., to the village of Shelton.

Pacific Coast.—This new company has been organized, and has absorbed the old San Luis Obispo & Santa Maria Valley road, which is in operation from Port Harford, Cal., by San Luis Obispo to Santa Maria, 42½ miles. The new company purposes extending the road by the Nipomo Cañon to Santa Barbara, about 60 miles.

St. Joseph, Kansas City & Arkansas.—This company has been formed by the consolidation of the Arkansas Northern Company, of Arkansas, and the Joplin & Arkansas Northern Company, of Missouri. The projected line is from Van Buren, Ark., northward to Joplin, Mo., about 120 miles.

St. Louis & San Francisco.—This company has purchased the property of the old Laclede & Ft. Scott road, including some 40 miles of graded road-bed and some right of way on the line from Lebanon, Mo., to Ft. Scott, Kan. The company will, it is said, complete the line, beginning work at once.

St. Paul Eastern Grand Trunk.—A contract has been let for the grading of 17 miles of this road from Oconto, Wis., westward. The road is to run from Oconto west to the Milwaukee, Lake Shore & Western road near Norrie, about 70 miles, with a branch from Oconto north to Peshtigo and Marinette, 20 miles.

Securities on the New York Stock Exchange.—The following securities have been put on the lists at the New York Stock Exchange:

Atchison, Topeka & Santa Fe, $5,000,000 sinking fund 6 per cent. bonds, secured by deposit of first-mortgage bonds of leased and controlled branch lines.

Burlington, Cedar Rapids & Northern, $1,475,000 first-mortgage 5 per cent. bonds, issued on the extension of the Pacific Division from Holland, Ia., to Spirit Lake, 153 miles. There are $825,000 of the same issue retained to retire an equal amount of 6 per cent. bonds issued some time ago.

Illinois Central, $10,000,000 leased line 4 per cent. stock, issued in exchange for Chicago, St. Louis & New Orleans stock.

Milwaukee, Lake Shore & Western, $1,000,000 additional common stock, making the whole amount of stock $7,000,000.

Minneapolis Union, $1,500,000 first-mortgage 6 per cent. bonds, guaranteed by the St. Paul, Minneapolis & Manitoba Company.

New York City & Northern, receipts of Farmers' Loan & Trust Company for first-mortgage bonds deposited under the bondholders' agreement of July 10 last.

Texas Central, $504,000 additional first-mortgage, 7 per cent., 30-year bonds, issued on 33 miles of new road.

Southern Pacific.—The track on the Mohave Branch is now completed to the new mining camp at Calico, 80 miles eastward from the main line at Mohave, Cal. A train to Calico will soon be put on. This leaves 160 miles to reach the Colorado River, of which 40 miles are graded.

Susquehanna & Delaware River.—This company purposes building a railroad about 100 miles long, from Harrisburg, Pa., to the Delaware River at Portland. It claims to be successor to the old South Mountain Company through purchase at one of the numerous sales of that company's property. It also purposes issuing $1,100,000 bonds to provide for the construction of the road.

Terre Haute & Indianapolis.—This company has begun work on the extension of its Terre Haute & Logansport line from Logansport, Ind., to South Bend. A section of 30 miles, from Logansport to Kewana, is under contract to be finished by the end of the year.

Texas, Northwestern & Gulf.—This company has filed articles of incorporation to build a railroad from Sherman, Tex., southeast to Sabine Pass, about 325 miles. The capital stock is fixed at $4,000,000, and the office will be at Terrell, Texas.

Texas & St. Louis.—A large force was to be put at work this week grading the branch line from Mount Pleasant, Tex., to Dallas.

Wheeling & Lake Erie.—A large force is now at work on the extension of this road from Zoar or Valley Junction, O., to Bowerston, about 16 miles, and this section is to be completed this year. On the 38 miles from Bowerston to Wheeling the work will necessarily take some time, as it is through a very rough country, and no less than seven tunnels are to be cut through.

Wisconsin Central.—On this company's new line to Milwaukee track is now laid for 10 miles south of Oshkosh, Wis., the last point noted. On the southern end track is now laid from Schleisingerville north 10 miles, and work is progressing very rapidly.

ANNUAL REPORTS.

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Eastern R. R. Association	281	Rochester & Pittsburgh	6
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Flint & Pere Marquette	72	St. Johnsbury & Lake Champ.	516
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Georgia	340	St. Louis & San Francisco	11, 175
Grand Rapids & Indiana	324	St. L., Vandalia & Terre Haute	484
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Kentucky Central	195	Utica & Black River	70
Knox & Lincoln	142	Vermont Valley	403
Lake Shore & Mich. So	271, 279	Vicksburg & Meridian	450
Lehigh Coal & Navigation Co.	128	Virginia Midland	142
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Little Rock & Ft. Smith	310	Wabash, St L. & Pacific	194, 218
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Manchester & Lawrence	340	Wisconsin Central	370

Nashville, Chattanooga & St. Louis.

At the close of the last fiscal year, June 30, 1882, this company worked the following lines:

	Miles.
Nashville, Chattanooga & St. Louis Railway, main stem	321
Shelbyville Branch	8
Jasper Branch	19
Fayetteville Branch	40
McMinnville Branch	48
Lebanon Branch	30
Centreville Branch	25
Duck River Railroad, leased	48
Total	539

Additions during the year were extensions of the Centreville Branch from Graham to Mill Creek, 4 miles, opened Dec. 1, and of the Duck River road from Petersburg to Fayetteville, 13 miles, opened June 1.

The equipment consists of 87 engines; 40 passenger, 4 mail and 14 baggage cars; 538 box, 52 stock and 1,272 flat cars; 1 pay car, 2 wrecking cars and 1 pile-driver. There are also 4 locomotives; 4 passenger and 1 baggage car; 12 box, 2 stock and 36 flat cars of 3 ft. guage on the Centreville and Duck River branches, which are narrow-gauge.

The general account is as follows:

Stock		$6,670,331
Funded debt		8,649,000
Interest and dividends		342,624
Interest on bonds held by U. S		153,600
Bills, accounts and balances		837,847
Profit and loss		513,395
Total		$17.166,797
Road and outfit	$15,711,489	
Real estate	84,246	
Assets not available	439,353	
Stocks and bonds	386,040	
Bills and accounts	129,133	
Cash	416,536	
		17,166,797

Cost of road was increased $779,134 during the year. Stock remained unchanged. The changes in bonded debt were the retirement of $494,000 Nashville & Chattadooga indorsed 6 per cent. bonds and $2,000 unindorsed 6s, and the issue of $992,000 main stem first-mortgage 7 per cent. bonds and $6,000 Duck River Valley second-mortgage indorsed 6 per cent. bonds; being a net increase of $502,000 during the year.

The $992,000 first-mortgage 7 per cent. bonds were issued in lieu of $500,000 due the United States, which were redeemed on June 1, 1881, and the $494,000 in dorsed 6 per cent. bonds redeemed July 1, 1881.

The earnings for the year were as follows:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Freight	$1,363,355	$1,618,924	D. $255,569	15.2
Passage	580 560	562,945	I. 17,615	3.1
Mail, etc	130,668	74,317	I. 56,351	75.1
Total	$2,074,583	$2,256,186	D. $181,603	8.0
Expenses	1,240,991	1,378.175	D. 137,184	10.0
Net earnings	$833,592	$878,011	D. $44,419	5.1
Gross earn. per mile	3,952	4,441	D. 489	11.0
Net earn. per mile	1,558	1,728	D. 140	8.1
Per cent. of exps	59.81	61.08	D. 1.27	....

The average mileage worked last year was 525 miles, against 508 the previous year.

The decrease was entirely in freight earnings, passenger and miscellaneous receipts showing a considerable increase. Of the decrease in freight $55,185 is due to a change in accounts, the amount received from the Memphis & Charleston road under the present contract being credited to rental, while under the old contract it went into freight earnings. The rest of the decrease was due to short crops and the competition of other roads.

The increase in passenger earnings was due to the decrease in passenger fares, which were 3 cents per mile last year, against 4 cents the previous year and 5 cents in 1879-80. This reduction has resulted in a large increase in travel.

The train and car movement was as follows:

Train miles:	1881 82.	1880-81.	Inc. or Dec.	P. c.
Passenger	546,798	498,692	I. 49,106	9.9
Freight	884,681	1,144,827	D. 260,146	22.7
Total	1,431,479	1,642,519	D. 211,040	12.8
Car miles:				
Pass.-train cars	2,667,195	2,618,195	I. 49,000	1.9
Freight cars	15,384,624	18,695,992	D. 3,311,368	17.7
Per train mile:				
Earnings	131.5 cts.	128.0 cts.	I. 3.5 cts.	2.7
Expenses	77.8 "	77 0 "	I. 0.8 "	1.0
Net earnings	53.7 "	51.0 "	I. 2.7 "	5.3

The decrease in freight train mileage was partly due to the use of heavier engines and the consequent increase of train-load. The total locomotive service was 1,979,923 miles, the average cost being 15.19 cents per mile run.

The statement of income was as follows, the main stem including the Shelbyville and Jasper branches:

	Net earnings.	Interest, etc.	Surplus or deficit.
Main stem	$768,218.73	$501,004 03	S. $257,214.70
Lebanon Br	38,036 07	23,650.45	S. 14,385.62
McMinville Br	13,626.77	15,428.35	D. 1,801.58
Fayetteville Br	12,502.83	16,896.41	D. 4,393.58
Centreville Br	2,658.70	8.591.43	D. 5,932.73
Duck River, loss	1,450.83	18,006.70	D. 19,457.53
Total	$833,592.27	$583,577.37	S. $250 014.90
Interest on investmen s			39,006.20
Balance from sale of bonds in previous year			566,569.73
Surplus from previous year			336,496.60
Total			$1,192,087.43
New construction and improvements	$640,445.71		
New equipment	359,551.97		
Extension of branches	212,432.37		
Dividends paid, 4½ per cent	300,164.91		
			1,512,594.96
Balance, excess of payments			$320,507.53

This balance is represented by the increase of floating debt. This debt can be liquidated by the sale of the bonds authorized to be issued upon the completion of the McMinnville and Centreville extensions and the disposition of the $144,000 Duck River bonds held by this company.

The report says: "The expenditures upon the track were rendered necessary by the condition of the Northwestern road, which, in 1880, was in poor order and not safe for trains, except at a low rate of speed. It is now in good order and safe for passenger trains to run from 30 to 40 miles per hour.

"The rolling stock which, two years ago, was entirely inadequate for the business of the road, has been increased and improved to an extent which will greatly facilitate the movement of freight and the comfort of passengers. Old light engines that could only pull 14 cars, or 168 tons of freight to the train, have been laid up, and new ten-wheel engines purchased in their stead, having a capacity of 20 cars carrying 20 tons each, or 400 tons to the train. This change will add largely to the future net earnings of your road in the reduction of the expense of transporting freight. The effect is already perceptible, the earnings having increased from $1.33 to $1.46 per freight-train mile.

"Whenever necessary the dilapidated depots along the line have been replaced by neat new brick or frame buildings, of uniform style, adding largely to the appearance and convenience of your road in its transaction with the public.

"Eight new ten-wheel engines have been purchased, three passenger engines built and 35 overhauled in the company's shops. Two old engines have been sold, making the total number now on hand 87, most of which are in good running order.

"During the past year four new coaches, two postal cars, 200 box, and 100 flat cars were purchased. The entire equipment of passenger, baggage and mail cars has been fitted with Miller's patent coupler and platform, and the Westinghouse automatic brake, rendering additional safety to passenger trains.

"During the year 18 miles of 58-lbs. steel rails were laid upon the Chattanooga Division, and 11.76 miles upon the Northwestern, a total of 29.76 miles. There were also 11.32 miles of rerolled iron rails laid upon the Northwestern Division, 6.59 miles upon the branches, and 9.83 miles of new side track were constructed.

"Thirty-five miles of the Chattanooga Division and 13⅓ miles of the Northwestern have been ballasted.

"On the main line 221,050 cross ties and 108 sets of switch ties were put in the track, and 57,134 cross ties and 13 sets of switch ties were used upon the branches. There have been built 727 feet of new iron bridges, 150 feet beam truss, 420 feet combination, 114 feet Howe truss, and 10,206 feet trestle work, a total of 11,617 feet, or over two miles of bridging and trestling."

Other improvements consist in new section houses and tanks; new fencing and safety gates at city crossings; a Ramsey car-hoist at the crossing of the Chicago, St. Louis & New Orleans; an elevator and wharf at Hickman; and an extension of the Chattanooga yard.

The report says: "The extension of the Duck River Valley road from Petersburg to Fayetteville, 13 miles, was completed in April last, and trains have been running since June 1. This extension was made in accordance with the lease of the Duck River road, at a cost to your company of $115,815.70. In addition to this sum, there is due the N. C. & St. L. $15,766.96 for moneys advanced to pay the floating debt of this road, making a total of $131,582.66. To offset this expenditure your company holds $69,500 first-mortgage and $75,000 second-mortgage bonds of the Duck River road, which, when sold, will be sufficient to repay the sums advanced.

"An agreement was entered into with White County for the extension of the McMinnville road from Rock Island to Sparta; White County agreeing to turn over to your company $30,000 of its bonds when the road is finished four miles beyond Caney Fork River, also to provide the right of way. In pursuance of this agreement work was commenced on the extension in September, 1881, and it is expected to be completed by January next.

"The Centreville Branch has been extended from Graham to Mill Creek, about four miles, and trains have been running since December, 1881. The grading of five miles more has also been completed, and iron is now being laid, and a contract for the remaining three miles, to Duck River, has been entered into, and the road will be ready for operation, within two miles of Centreville, by Oct. 15, and to the north bank of the river by Dec. 1. There are large deposits of iron ore two miles west of Graham station, which, together with the lumber, agricultural products, and pig iron from Warner Furnace, will afford all the business that can be done upon the Centreville Branch with its present equipment.

"An agreement has been made with the Tennessee Coal, Iron & Railroad Company to extend the Jasper Branch from Victoria to Inman, about five miles, for the purpose of rendering accessible the immense deposits of iron ore at that point. The Coal Company believe they will ship 50 to 60 cars per day, and guarantee the shipment of 30 cars of ore daily over this extension. The Coal Company also agree to construct the road at its own expense and turn it over to your company, when finished, in consideration of the issuance and delivery, to them, of Nashville, Chattanooga & St. Louis 40-year 6 per cent. bonds, secured by first-mortgage on the extension, to an amount, at their par value, equal to the cost of the road, not exceeding, however, $16,000 per mile. It is expected that this extension will be completed and in operation by December next.

"The various mills and factories referred to in last report, as being constructed on your lines at Nashville, have been completed and are in successful operation. There have been built during the year a cotton factory, woolen factory, planing mill, and fertilizer factory, on the Northwestern Division, near Nashville, and the National Fertilizer Company is erecting a large structure for the manufacture of fertilizers, three miles east of Nashville, on the Chattanooga Division.

"The bonds of the Sewanee Furnace Company, $84,000, which were indorsed by the Nashville, Chattanooga & St. Louis for the purpose of aiding in the erection of a furnace at Cowan, have been taken up by that company and canceled, and your company is released from this obligation."

Louisville & Nashville.

The full report of this company for the year ending June 30, 1882, has not yet reached us; the following figures are from an abstract sent by telegraph of the President's report as presented at the annual meeting on Wednesday.

The stock and funded debt at the close of the two years were:

	1882.	1881.
Stock	$18,133,513	$18,130,913
Funded debt	58,117,778	46,991,840
Total	$76,251,291	$65,122,753

This is an increase of $2,600 in stock, and of $11,125,938 in funded debt during the year. The stockholders on Wednesday ordered an increase of the stock to $30,000,000.

The earnings for the year were as follows:

	1881-2.	1880-81.	Inc. or Dec.	P. c.
Earnings	$11,987,745	$10,911,650	I. $1,076,095	9.9
Expenses	7,429,371	6,713,132	I. 716,239	10.6
Net earnings	$4,558,374	$4,198,518	I. $359,856	8.6
Interest, etc	266,442	225,209	I. 41,233	18 3
Total	$3,824,816	$4,423,727	I. $401,089	9.1
Charges	4,145,908	3,079,088	I. 1,066,820	34.3
Surplus	$678,008	$1,344,639	D. $665,731	49.5

The charges include interest, rentals and last year $110,000 loss on Georgia lease. From the surplus one dividend of 3 per cent. was paid, leaving a balance of $135,008.

The working expenses were 61.97 per cent. of earnings, against 61.52 per cent. the previous year.

The President's report says: "The company has made large expenditures during the years for additions to and improvements of the roads, for equipment, and for advances to dependent companies. The bonds marketed did not provide in full for these necessary expenditures. The company has, therefore, incurred additional floating debt in order that there should be no delay in improving the property and increasing its earning capacity."

President Baldwin estimates that it will require $2,000,000 additional expenditure in the next six months to complete improvements for which the company is already under contract, and including the completing of the Knoxville Branch and other constructions.

West Jersey.

During the year 1881 this company operated the following lines:

	Miles.
West Jersey. Camden. N. J., to Cape May	82.47
" " Glassboro to Bridgeton	18.60
Swedesboro R. R., Woodbury to Swedesboro	10.80
Salem R. R., Elmer to Salem	16.58
W. J. & Atlantic, Newfield to Atlantic City	34.46
Total	162.91

The West Jersey & Atlantic road was completed and opened for business in June, 1880. The company owns a large interest in the leased lines, and also owns the Stockton Hotel at Cape May.

The equipment consists of 23 locomotives; 58 passenger, 10 combination and 6 baggage cars; 26 box, 2 stock, 74 flat, 97 dump and 6 caboose cars; 26 hand and 20 push cars. One engine was added and 15 old passenger cars sold.

The general account, condensed, is as follows:

Stock		$1,359,750.00
Bonds		2.755,500.00
Certificates of debt for Cape May & Mill. stock		6,400.00
Accounts and ballances		158,504.07
Profit and loss		145,582.38
Total		$4,425,736.45
Road and equipment	$3,288,493,57	
Stock of leased lines, etc	709,775.88	
Sinking funds	193,750.00	
Materials	97,668.75	
Accounts and balances	106,899.11	
Cash	29,149.14	
		4,425,736.45

The bonded debt consists of $313,500 bonds, of 1883, 6 per cent.; $1,000,000 bonds of 1896, 6 per cent.; $1,000,000 bonds of 1899,7 per cent.,and $442,000 bonds of 1909, 6 per cent., the yearly interest charge being $175,330. The trustees of the sinking fund hold $339,000 of the bonds. During the year $100,000 bonds were sold for $109,063.50, the proceeds being used for second track and other improvements.

The traffic for the year was as follows:

	1881.	1880.	Inc. or Dec.	P.c.
Engine miles:				
Passenger	501,906	461,885	I. 40,021	8.7
Freight	148,686	116,336	I. 32,350	27.9
Distributing	19,778	45.305	D. 25,527	56.7
Total	670,370	623,526	I. 46.844	7.5
Car miles:				
Pass-train cars	1,675,056	.....	.....	....
Freight cars	1,848,365	.....	.....	....
Passengers carried	1,238,132	969,197	I. 268,935	27.8
Passenger-miles	42,550,400	32,377,640	I. 10,172,760	31.4
Tons freight carried	276,807	186,350	I. 90,457	48.6
Ton-miles	9,046,582	5,680,110	I. 3,366,472	59.3
Av. receipt:				
Per pass-mile	1.443 cts.	1.480 cts.	D. 0.037 cts.	2.5
" " net	0 427 "	0.340 "	I. 0.087 "	25.6
Per ton-mile	3.074 "	3.510 "	D. 0.436 "	12.4
" " net	1.650 "	1.490 "	I. 0.160 "	10.7

Of the freight-car mileage 71.2 per cent. was of loaded cars. The very low average passenger rate is due to the large number of excursion passengers carried during the summer at extremely low rates.

The earnings for the year were as follows:

	1881.	1880.	Increase.	P.c.
Passengers	$621,516	$480,424	$141,092	29 4
Freight	289,475	199,591	89,884	44.9
Mail, etc	77,535	76,592	943	1.2
Total	$988,526	$756,607	$231,919	30.6
Expenses	560,954	483,129	77,825	16.1
Net earnings	$427,572	$273,478	$154,094	56.3
Gross earn. per mile	6,068	5,147	921	17.9
Net " "	2,625	1,860	765	41.1
Per cent. of expenses	56.75	63.86	.....	....

The West Jersey & Atlantic road was worked for the whole year in 1881, and for 6½ months only in 1880. A large part of the increase in earnings came from the Atlantic City business secured by that road.

The West Jersey Express earned $68,216 gross and $41,822 net, the net earnings showing an increase of 35.3 per cent.

The earnings and result on the various lines were as follows:

	Gross earn.	Net earn.	Charges.	Surplus or deficit.
West Jersey	$801,441	$362,467	$175,726	S. $186,741
Swedesboro	20,333	6,787	19,901	D. 13,114
Salem	31,190	5,284	13,133	D. 7,849
W. J. & Atlantic	135,562	53,035	53,035	.....

The charges on the West Jersey are interest paid; on the other lines the rentals paid by the West Jersey Company.

The income and profit and loss accounts were as follows:

Net earnings		$427,572.17
Interest on deposits		3,074.69
Total		$430,646.86
Interest	$175,726.00	
Rentals	33,034.00	
Net earnings W. J. & Atlantic road	53,034.53	
Dividend, 4 per cent	54,390.00	
		316,184.53
Balance to profit and loss		$114,462.33
Sundry receipts		9,746.37
Balance, Dec. 31, 1880		153,712.12
Total		$277,920.82
Additions and improvements	$75,661.07	
Old fire damage claims	14,702.47	
May's Landing accident	41,974.90	
		132,338.44
Balance, Dec. 31, 1881		$145.582.38

Additions to property include $21,570.10 for extension of the Salem road into the city of Salem, and $19,189.45 for the annex to the Stockton Hotel at Cape May. The May's Landing accident is now all paid for.

During the year 16.33 miles of new steel rails were used and 79,714 new ties were laid. Eleven miles of second track were completed and seven miles more partly finished. An extension of the Salem road to a better terminus in Salem was begun.

Assistance has been extended to a branch line from Seaville to Sea Island City. The company has taken a majority of the stock of the Woodstown & Swedesboro road, now nearly finished from Swedesboro to the Salem road near Oakland, 12 miles.